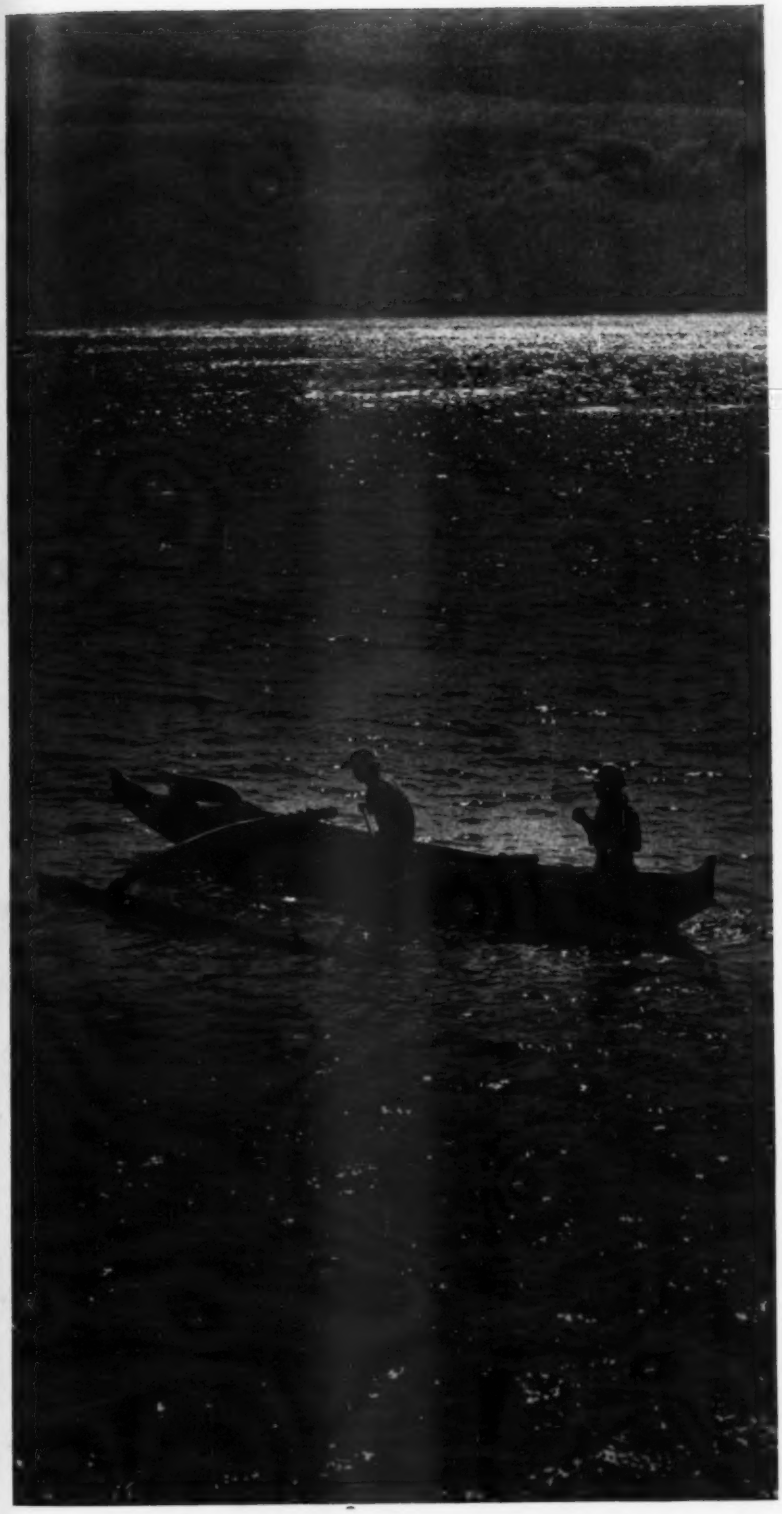

A Honolulu boat using outriggers to give stability

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December 1918

MOTOR BOATING

Vol. XXII No. 5

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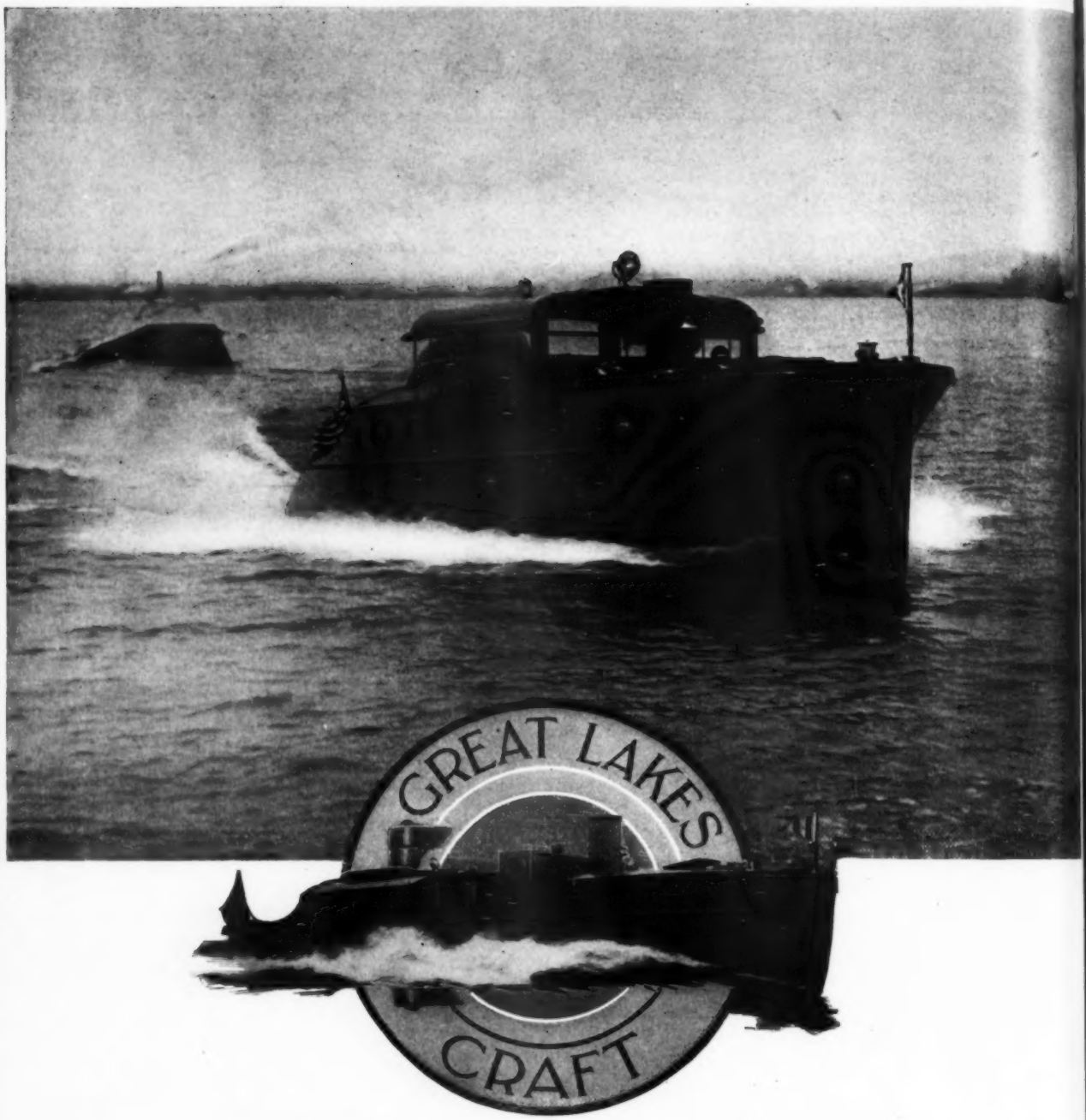


And Now to Return to Normal

YOU can now enjoy the recreation and pleasure to be derived from the ownership of a Great Lakes Express Cruiser.

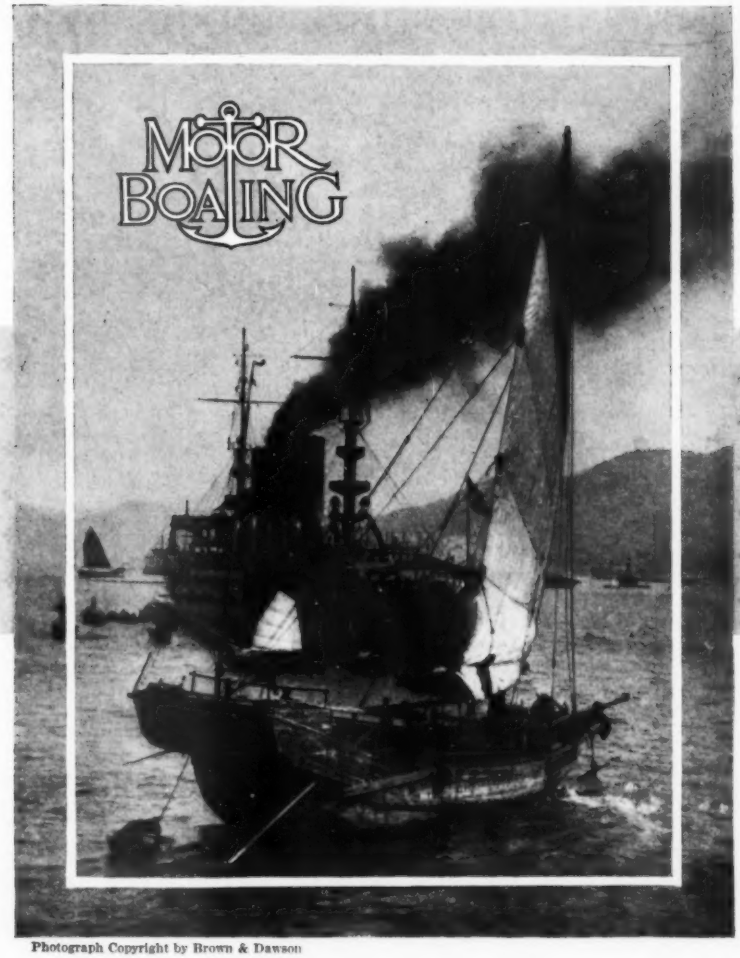
As rapidly as our factory and organization can wind up its various War activities, it will be turned over to the building of large numbers of Standardized Great Lakes Express Cruisers.

In the meantime, two Great Lakes Express Cruisers, completed in between Government Contracts, are now ready for IMMEDIATE delivery. One is a Fifty Footer and the other a Fifty-two Footer.

A very remarkable opportunity for you to obtain immediate delivery of an extremely well designed, built and equipt boat.

GREAT LAKES BOAT BUILDING CORPORATION **Milwaukee, Wis.**

Designers and Builders of Boats of Distinction and Quality



Photograph Copyright by Brown & Dawson

Victory

What the Return to Peace Conditions Means to the Sport and Industry—Motor Boating to Grow in Usefulness and Popularity without Bounds—A Prosperous Season Next Year for the Manufacturers, Clubs, and Associations Predicted

PEACE is here. All restrictions on boating and yachting have been removed or will be shortly. The freedom of the seas is assured for all times. War work is *non-essential* now and all forms of domestic industry are decidedly *essential*.

But we are as unprepared for peace as we were for war eighteen months ago? Yes, and perhaps more so. However, there is just one difference between the two conditions. The Government did not ask us to tell them how to run the war but they are going to ask business and industry to tell them how to get back to peace conditions. Just there the golden opportunity lies, which taken advantage of, will mean inestimable prosperity for the marine industry as well as all other manufactures for decades to come. If we do not measure up to the possibilities, it will mean all kinds of Government supervision, Government trade boards and restrictions on materials and manufacturing.

During the war period, we accomplished in less than two years that which Germany had been attempting to do for half a century. But this required sacrifices on the part of everyone. Everything had to be done in a big way or we would have failed. It was push, push, push. Just so in getting back to peace conditions, it will require immediate action in a big way. Hesitation or procrastination will undo all the good which the experiences of the war have taught us.

The marine industry—that of building motors, boats or accessories, is no different from the thousands of other crafts which compose the big American business machine. No less obligation or responsibility rests on us. If anything, the tasks and responsibilities of our own industry are greater. America is to become a great maritime power as the result of the war. All signs point to it. As a result the American public will become the greatest sea-loving nation in the world. This will mean new ships and new boats and more ships and more boats. The range of possibilities of it all is far beyond our comprehension at this time.

Motor boating as a sport and pastime bears a direct and important relation with the future development of our country. Victory over Germany means the development of motor boating on a scale never before even hoped for. Development of our plans of a new merchant marine, foreign commerce, a great navy and the world's greatest maritime power goes hand in hand with development in motor boating and yachting. One

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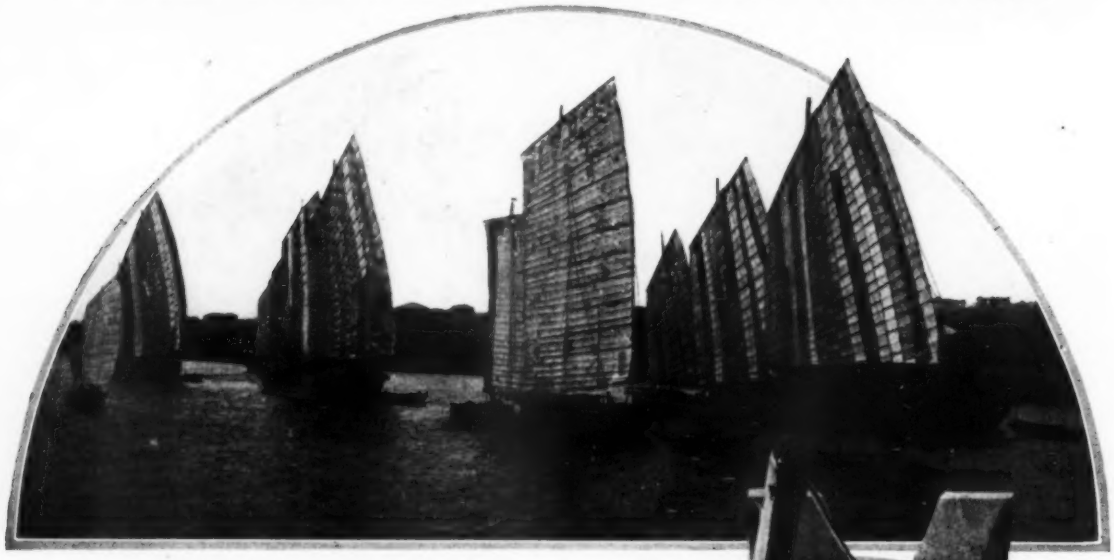
Fertile Fields for Motor Boats to Invade



In no country has the art of shipbuilding progressed as little as in China. The junks with their sails of straw matting are the same as they were centuries ago. The illustration above shows a fleet of salt junks on Yangtse Kiang River and the one below a group of sampans on the Pearl River. Think what a few American marine motors would do in a year or two over in this part of China

Photographs copyright by Brown & Dawson

A native canoe in Bolivia, South America

In Alaska they still make boats of this type cut from a solid log of cedar. American motor boat manufacturers could cultivate to advantage this field for their products

Exporting—The Policy of the Future

With Peace Comes the Golden Opportunity for the Manufacturers of American Marine Motors and Boats to Engage in the World Trade

By B. Olney Hough
Editor, American Exporter

FOUR HUNDRED AND FIFTY-SEVEN gasoline marine engines were exported from the United States in July, 1918. Who says that no one can export, that there aren't any ships? Some people are exporting, every week, every month. Later figures than those for July are not yet available. But consider the following:

Exports for seven months ending July 31:

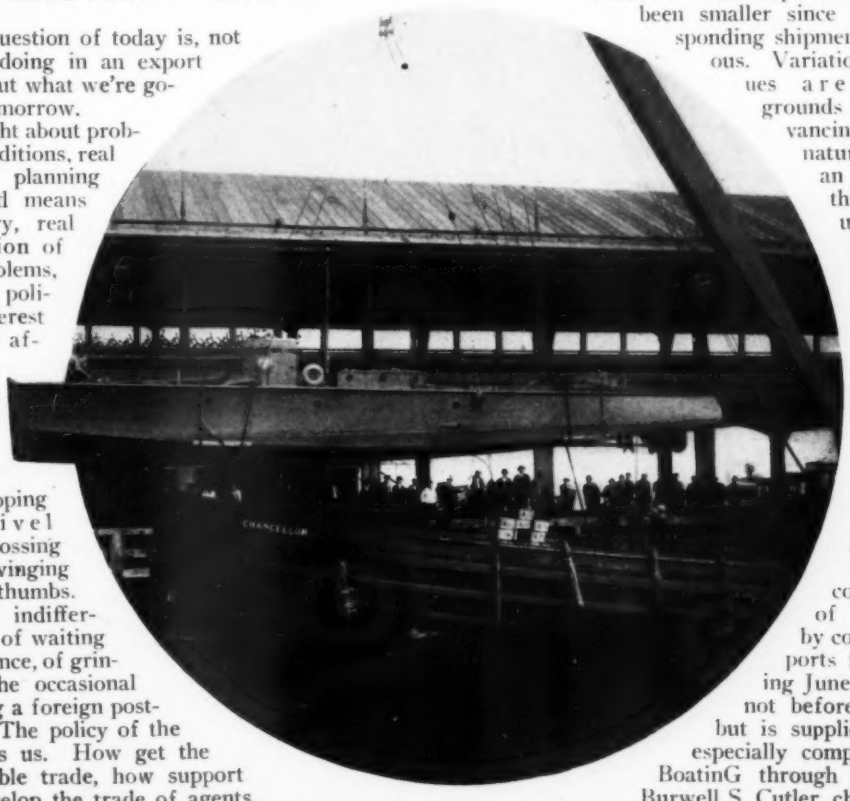
1918	$1,409,865
1917	1,267,096

No, you're wrong again! These engines were not destined for war work. England, France, and Italy are not buying quite as many marine motors from us as they did in pre-war days. These engines go all over the world.

It is not easy shipping for export, nowadays. It is hard finding ocean cargo room. But it's being done, every week and every month, as I've said. I have little patience with the man who says it can't be done. Let him go down to the New York customhouse and inspect the outward manifests, and find the very names of the ships which carried motors to various foreign ports.

The real question of today is, not what we're doing in an export way today, but what we're going to do tomorrow.

Real thought about problems and conditions, real study, real planning of ways and means are necessary, real consideration of State problems, Government policies, real interest in National affairs, all of them spelled with capital letters. The day is past of tipping back in swivel chairs, of crossing knees, swinging legs, twirling thumbs. The day of indifference is gone, of waiting the lucky chance, of grinning over the occasional order bearing a foreign postage stamp. The policy of the future claims us. How get the largest possible trade, how support and help develop the trade of agents, distributors, dealers. And, first of all, what plans are we making, and are they wise and intelligent for meeting after-the-war demands, for capitalizing our unique National position and advantages, for building on the foundations we've already laid?



American-built motor boat being delivered to the pier for export

But we're getting a little ahead of our story. Let us see how our record stands. During the fiscal year ending June 30, 1918, we exported from the United States 7,223 gasoline marine motors—not quite so many, in number, as in 1917 and 1916, but a lot more than in 1915, and valued at 75 per cent. more than our exports of 1914 and 1913. Granted the great increases in costs and invoice values, is not our record still a wonderful one?

Consider the story of our foreign shipments of gasoline marine motors as told by official government statistics from the year before war broke out in Europe down to the end of June, 1918:

Exports of Gasoline Marine Engines

Year.	*Number.*	*Value.*	*Ave. Price.*
1913	10,940	$1,586,926	$145
1914	11,606	1,599,364	138
1915	5,907	753,476	128
1916	8,002	3,139,955	392
1917	9,815	2,204,114	224
1918	7,223	2,596,166	359

Again you must be reminded that our exports during these four years have not been confined to France, England, and Italy. The contrary is the case, so far as motors are concerned. Our trade has grown in other markets. Our shipments to Europe have been smaller since 1915 than corresponding shipments in years previous. Variations in invoice values are explainable on grounds of rapidly advancing costs and the natural fluctuations in an industry such as this from large units, one year, to small motors the next (and included are our outboard rowboat motors), and from expensive types to cheaper models, with the fancies of buyers or the effectiveness of manufacturers' appeals.

Study the accompanying table of the distribution by countries of our exports for the year ending June 30, 1918. It has not before been published, but is supplied to the writer, especially compiled for MoToR BoatinG through the courtesy of Burwell S. Cutler, chief, and the Division of Statistics of the Bureau of Foreign and Domestic Commerce. That courtesy means much in these congested days of hectic work in the tremendous demands of the war. See in this table the world-wide demand for our motors, as well as our ability last year to ship them to world-wide destinations. It is more than merely significant—it is one of the most inspiring indica-

tions for our future trade that can be found. If we can do these things with restricted raw materials, freight embargoes on the railways, export license complications and comparatively few ships, what shall we not accomplish when doing business becomes easier once more and when all the world insistently demands motors for pleasure and cargo boats, when men begin to indulge in luxuries once more and long deferred expansion equipment at last is scrapped, when up-to-date, modern, more efficient equipment becomes imperatively necessary?

Turning now to the export record in motor boats we find the following statistics in the official statements of the Department of Commerce:

Exports of Motor Boats

Year.	*Number.*	*Value.*	*Ave. Price.*
1913	516	$768,523	$1,489
1914	400	519,584	1,296
1915	164	273,516	1,668
1916	264	800,231	3,031
1917	230	$917,438	$3,989
1918	218	2,460,583	11,287

Eye and thought are at once arrested by the extraordinary increase in values for last year, that is, the fiscal year ending June 30, 1918. The explanation is to be found in the annexed special table showing the distribution of our exports by countries for 1918. Evidently a good many of our "motor boats," so called, were intended for war work in Italian waters. However, enough and more than enough remains, in the way of scattered exports to all parts of the world, to carry an impressive lesson of what we have been able to do and can still do, in war times. It will be acknowledged that freight room must be particularly hard to find in these days for bulky, deck cargo such as motor boats. That we have been able to ship any at all, except for war work, is little less than a miracle and once more emphasizes the fact

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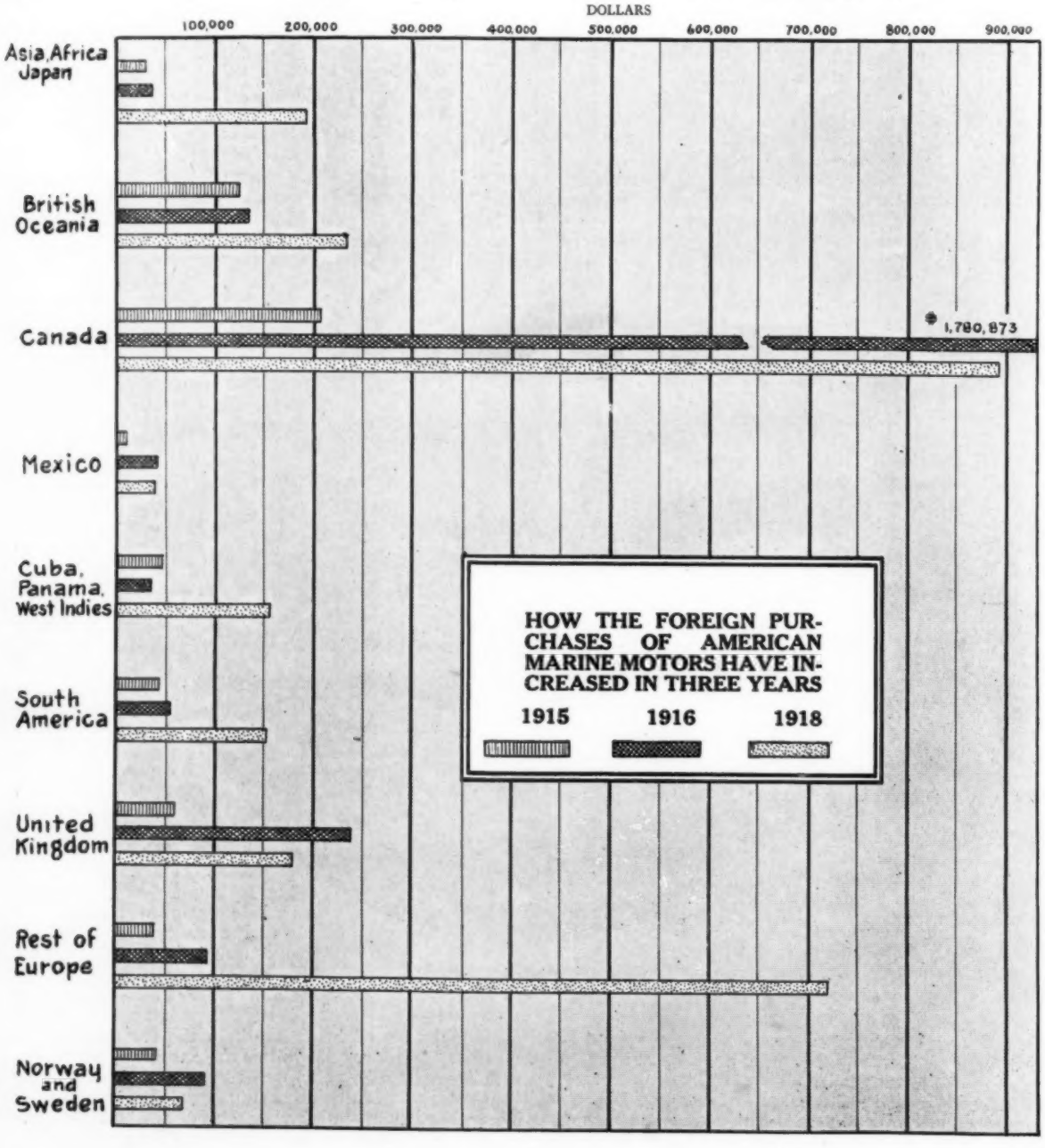


Motor Boats That Won the War

American Boat Builders Produced Hundreds of Little Fighting Ships Powered with Gasoline Motors Which Drove the U-Boat to Cover

By R. B. Clark

Photographs by Pearce

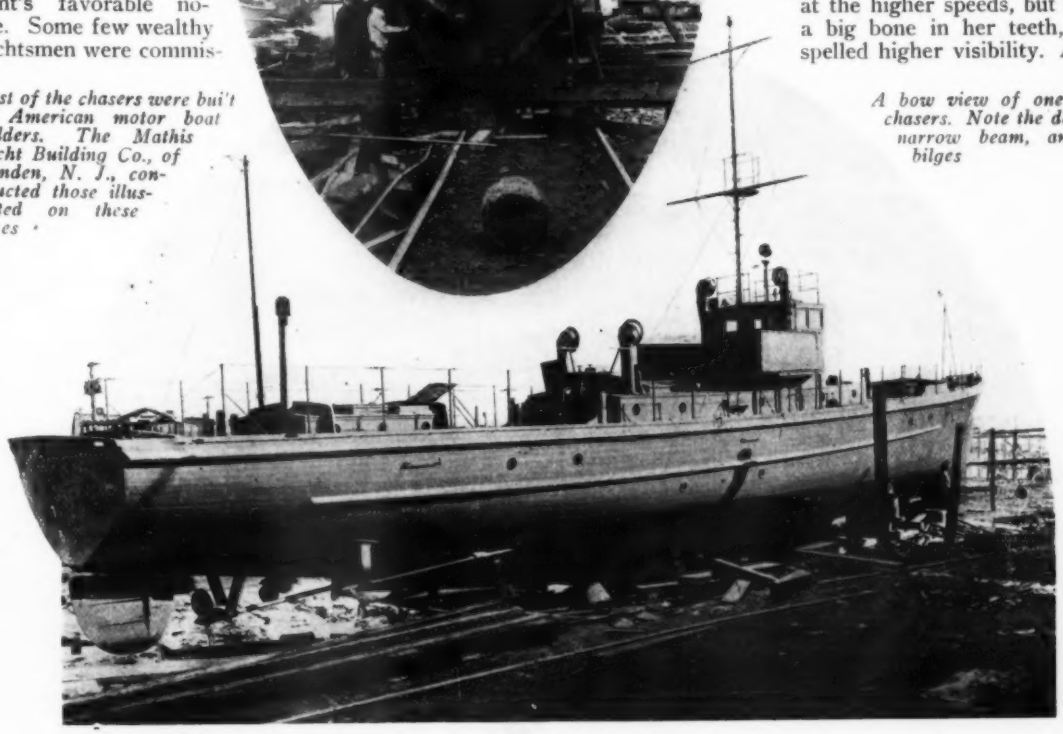
AT a time, early in 1917, when war between our Country and the Hun commenced to loom up as more than a possibility, the Navy Department began to take stock of the possible weapons available for use against the submarine. Great Britain had made good use of her motor and fishing fleet, and incidentally even some sail boats, and had turned to us for a large number of the since famous "M.Ls", the able eighty-footers, of which Italy also bought a number. Russia had us build a small fleet of fast sixty-footers which were excellent boats for use in harbors and other protected waters. Some of our yachtsmen were offering their motor cruisers and steam yachts for scout duty. An enthusiastic number of patriotic Eastern Yacht Club men organized a small squadron of one-design forty-footers, which attracted the department's favorable notice. Some few wealthy yachtsmen were commissioning designers to turn out scouts which were hoped would prove useful.

The stock taking was not particularly reassuring, however. The destroyer seemed at that time to be the best weapon afloat for the purpose, but destroyers take time to build, and could not be produced and manned in such numbers as were required. The department decided that nothing they had thus far seen would fill the immediate needs, so began outlining the salient features of a vessel that would; a good all-around boat that could be built rapidly in quantities. The Bureau of Construction and Repair of our Navy is, from the chief down, composed of men who know their book, but their book called for bigger ships than 65-ton submarine chasers. So they sent for Swasey, who designed the Eastern Yacht Club forties, told him the requirements, consulted him about details, and instructed him to go to work. Swasey *can* hustle when he wants to, and he did. The Bureau gave him a nice sunny room, a bunch of men to help, and turned him loose.

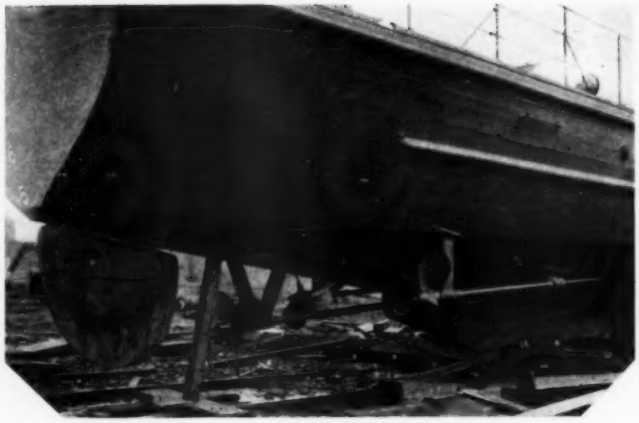
The design of the 110's developed rapidly. With the limiting requirements in view, the Bureau got out a set of lines and so did Swasey. Two models were made and towed in the model basin at the Washington Navy Yard. One excelled at the higher speeds, but carried a big bone in her teeth, which spelled higher visibility. A com-

Most of the chasers were bui't by American motor boat builders. The Mathis Yacht Building Co., of Camden, N. J., constructed those illustrated on these pages

A bow view of one of the chasers. Note the dead rise, narrow beam, and easy bilges



promise was made incorporating the best features of each model, and the construction and detail drawings developed. Several leading yacht and wooden ship designers and builders were invited to come to Washington for a conference which brought forth some good ideas. There was no time, however, for experiment, so the final details were decided upon, and bids invited. All this was done in a remarkably short time.



The lines at the stern and quarter are extremely easy and assure a good sea boat

Some thirty or more contracts were let, most of them to motor boat builders, and the balance to wooden ship builders and Navy yards having the needed facilities. Over 300 boats were contracted for.

During this time the Bureau of Steam Engineering had been searching for a suitable power plant. It was found there was but one concern in the country equipped to turn out the required number of engines by the time they would be needed. This company, the Standard Motor Construction Co., of Jersey City, was building engines for the British "M.L.'s," and also for the Italians; engines of the same type wanted for our chasers. It was originally intended to equip the 110s with two 300 h.p. engines, but as the contractor's entire plant had been devoted almost exclusively for several months to the production of 220 h.p. engines for the British and Italians, it was decided that surer deliveries could be made by continuing with this model, using three of them, instead of working up production of the 300 h.p. machines.

As is customary when vessels are built for the Navy, their construction is under the supervision of naval officers; an engineering officer inspecting the power and lighting plants, and a naval constructor the hull proper, etc. The added work of inspecting the 110s, however, could not well be saddled on these very busy officers, especially as many of the boat yards were not within easy reach of the large plants where the Navy men were stationed. The services of civilian resident assistant inspectors were secured through the civil service. These men were chosen from among yacht designers and builders and men with marine gasoline engine experience. They reported in the main to the naval officers stationed at the nearest shipyard.

Simplicity and ruggedness of construction and avoidance of hard curves, were prime factors in the development of the design. The wisdom of this is apparent when it is borne in mind that some of the builders were inexperienced in anything smaller than a coasting schooner or tugboat. The boats are divided into eight compartments by four water-tight steel bulkheads, one water-tight wooden bulkhead, and two non-water-tight steel bulkheads. The keel construction is very heavy, of yellow pine and oak. Bilge stringers, hogging girder, shelf, clamp, and sister clamp, all of yelow pine, are tied together with the seven bulkheads in such a manner as to give the boats very unusual longitudinal strength. This despite the dire predictions of weakness made by some of the builders and inspectors, the writer included. The frames are steam bent white oak, spaced 12-inch centers, and doubled in the engine compartment. Floors of white oak. Planking of long leaf yellow pine, some

A cruising radius of 1,500 miles at speed is only part of the story. Scores of the boats made the trip across the ocean under their own power manned mostly by crews of Americanyachtsmen who had enlisted in the U. S. N. R. F.

In different stages of construction; a boat with the keel and steel bulkheads in place, another nearly planked

builders using white oak for garboards. Stems and stem-knees of white oak. Transoms curved, framed of white oak, and double planked, inner skin of white cedar, outer skin of mahogany. Decking of Port Oxford cedar or Oregon pine. Deck beams of white oak and yellow pine. Several hackmatack knees are worked in the larger compartments, and the gun foundations are heavily reenforced with steel diagonals, plates, web-frames, wood blocking and extra heavy pipe stanchions. The engine foundations are very rugged, and the lack of vibration with all three engines hooked up is remarkable. Fastenings are of galvanized spikes, rods, and bolts. Altogether the construction is very wholesome, and while considered by some to be needlessly heavy, the fault, if such it be, is a good one. One of the chasers was rammed by a sister ship in a snowstorm, and nearly cut in two. She floated for several hours, and no lives were lost.

The cruising radius is about 1,500 miles. The speed, by the way, is ample to meet the requirements. Greater speed could have been attained by lightening the construction and using higher speed engines. Considering the hammering the boats were to get, however, it was wise to build for strength and reliability, rather than ability to do a fast mile occasionally, consequently the slow speed, heavy-duty type of motor was chosen. If the strategy of the chaser could be told, it would be readily recognized that our 110's fill the bill.

The lines are very easy. A decided deadrise, narrow beam, and easy bilges, while providing limited initial stability, combine to produce an excellent performer in broken water. The curve of areas is concave forward and aft, and with very clean waterlines, diagonals and buttocks makes an easily driven hull, despite the displacement of about 68 tons. Freeboard and flare forward is ample to take care of nasty head seas, and the long keel, deadrise and skeg make for good performance in a following or quartering sea. Roll? Surely they do! But rest assured the department knew the extent of the roll when the boats were designed, and that the metacentric height of slightly less than 1.5 ft. is the proper dimension to produce the best gun platform that the other limiting factors permitted. One of the little vessels struck heavy weather outside in midwinter, a big quartering sea. The commanding officer rang up a little too much speed, and she broached. Just then a big grey one hit her, and she laid over on her side with the pilot house partly awash. She recovered, however, and made port under her own power. A squadron of them was on patrol off the coast of France. The weather got nasty. The French cruisers, trawlers, and other auxiliaries made for port till the weather moderated. The 110's stayed out and "carried on." On the way over, one of them got out of touch with her convoy. The radio apparatus went out of commission. Finally the little ship ran out of fuel, about in midocean. The crew devised a jury rig of bedding, etc., and she *sailed* the rest of the way. It took her about a month, and all sorts of weather was experienced. The crew had *some* appetites on arrival, but she made port and no lives lost. Yes, they are seaworthy!

The three 220 h.p. Standard motors with which the boats were powered. These motors gave excellent satisfaction under all conditions

Most of the "S.Cs." are officered and manned by members of the Reserve Force, and some of these men are living up to true sea-going traditions by growling about the accommodations. A full complement consists of twenty-two men. The quarters are somewhat cramped, to be sure, but the chasers are not yachts, and the Navy is not conducting a yachting

(*Cont. on page* 54)

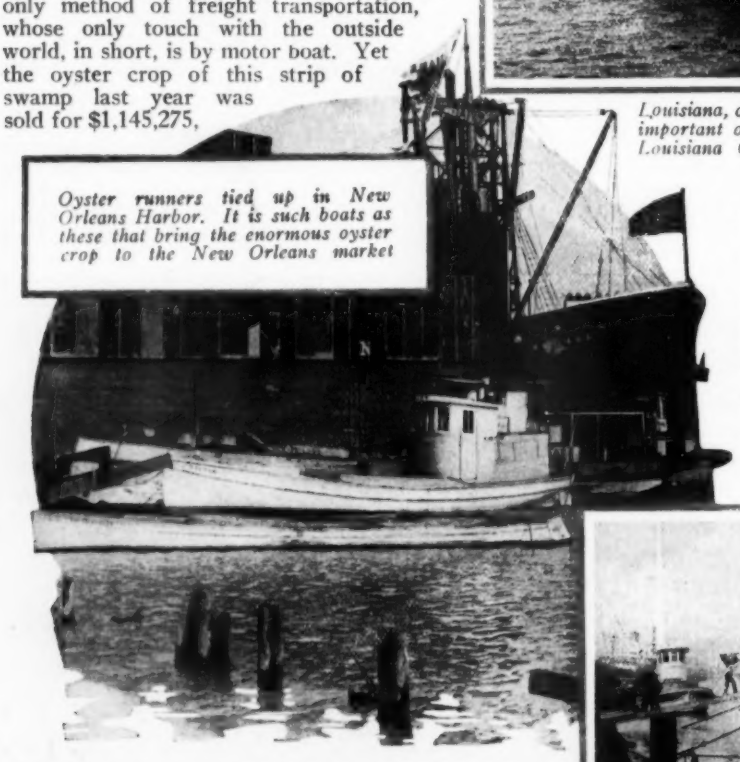
Where Motor Boats Handle Millions

An Ever-Increasing Field of Usefulness in the South and Gulf of Mexico—Industries Which Are Dependent Upon the Gasoline Engine and Motor Boat

By Harry H. Dunn

MOST people, at least those who live north of the now nearly-forgotten Mason and Dixon line, hold firmly to the opinion that New Orleans stands on the shore of the Gulf of Mexico. Few realize, until they have spent a winter in the Crescent City, that one cannot step on a street car, or rent an automobile, and ride out to the gulf for a morning swim. Yet between New Orleans and the real salt water at the mouth of the Father of Waters is 110 miles, not as the Liberty Motor flieth, but by the only way one can get there, round the winding bends and through the tortuous channel of the Mississippi River.

And in between lies a strip of land, extending from Mississippi Sound on the east, approximately 225 miles to the mouth of the Sabine River on the west, ranging from sixty down to fifteen miles in width, whose only means of ingress and egress, whose only method of freight transportation, whose only touch with the outside world, in short, is by motor boat. Yet the oyster crop of this strip of swamp last year was sold for $1,145,275,

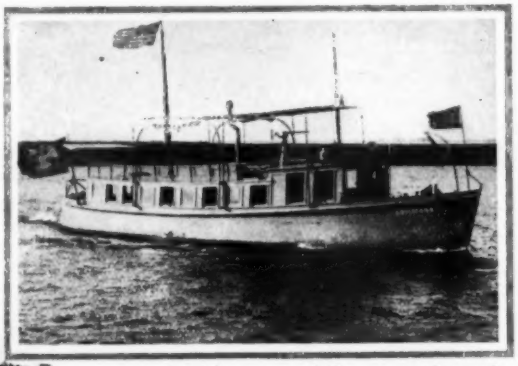


Oyster runners tied up in New Orleans Harbor. It is such boats as these that bring the enormous oyster crop to the New Orleans market

while the industry itself is valued at $5,100,125, by the state conservation department, charged with supervision of the state's resources. Out of this same swamp, in 1917, came $850,000 worth of shrimp, with $150,000 more consumed locally by the fishermen and the inhabitants of the smaller towns who bought their supply direct from the shrimp seiners.

Likewise, this lower coast of Louisiana, sent out $150,000 worth of diamond-backed terrapin, and $50,000 worth of ordinary turtles, with $50,000 worth of crabs, in the same period, and the fish these regions produced in 1917 were worth more than $750,000, with $200,000 more worth of fish consumed by local residents. Fresh water fish from the streams and lakes and bayous of this same area, totalled in value $2,500,000 for the year, with no possible record of the worth of those taken by individual anglers for home consumption.

Thus, in one year, this section of Louisiana produced nearly six million dollars worth of sea foods, without stopping to enumerate the value of the frog catch, worth about $110,000 a year, the clam industry, the production of mussel shells, or the take of alligator hides.



Louisiana, one of the most active and important of the patrol boats of the Louisiana Conservation Department

Seventy-five per cent. of this sea food was carried to canneries or to immediate market in some form of power boat.

Out of this same coastal strip of Louisiana came furs sold by the trappers for $1,017,000, also handled all by boat, and about ninety per cent. by motor boat.

From the more solid sections of this swamp came vegetables, fruits and other products of the soil worth between $800,000 and $1,000,000, there are no more definite figures than those of the tenders of canals leading into and out of the lower part of the state, all carried to market by motor boat.

By as close estimate as possible, one-third of the cotton, sugar, and rice crops, the three great staple agricultural products of Louisiana, from all over the state, was handled, at some stage of its progress to market, by motor boat, motor tug or motor barge.

Winnie Davis, freight- and passenger-carrying motor boat, at New Orleans. This photograph shows well the typical hull construction of these broad-beamed, shallow-draft motor-powered workboats

The vegetable crop of Grande Isle, that lone land

outpost of Louisiana against the Gulf of Mexico, a crop worth more than $300,000, was taken to market in its entirety by motor boat.

And all the merchandise, all the mails, all the passengers, which went into this great southern third of Louisiana, went on motor boats.

The estimated value of all these products, leaving out the sugar and cotton and rice, because there is no means of approximating just how much the motor boats contributed to their handling and marketing, for the year past was $8,000,000, of which the motor craft, ranging from big fishing auxiliaries to slim, speedy oyster runners, handled $6,000,000 worth, or half a million dollars' worth of cargo a month.

This does not take into account, either, the big, self-propelled steel barges of the Alabama and New Orleans Transportation Company, which carry coal and pig-iron from the Alabama fields into New Orleans, nor the still larger motor barges which have inaugurated a service between St. Louis and way ports and New Orleans.

It does not include the several motor ships which carry oil to the allies from the tanks of the Standard Oil Co., at Baton Rouge, nor does it consider the largest auxiliaries in the world, described by the writer in a previous article, which, built on the gulf coast, are bearing lumber and food and munitions overseas by the aid of their large crude-oil engines.

It merely covers the working motor boat fleet of one southern state, probably the largest work boat fleet, and the busiest—for there is no winter to tie it up—of those of any state in the Union. Certainly the value of the cargoes it handles is as great or greater than that of similar craft in any similar area in the world.

In all Louisiana there are about 1,500 working motor boats. Some of these devote their winters to work and their summers to excursion and other pleasure operations for hire; still others reverse the seasons, and, working in the vegetable and fruit crops all summer, turn themselves out for hire for cruises in the winter. The southerner takes his water vacation in the summer, while the northerner who comes south to spend the colder months, finds southern seas and rivers and canals and bayous just as attractive in the winter.

These boats may be divided roughly into three classes: Fish, shrimp, and oyster boats; freight- and passenger-carriers, and the miscellaneous group of tow boats, dispatch boats, ferries, small motor barges and the like.

No figures on the numbers in each of these divisions are available, for

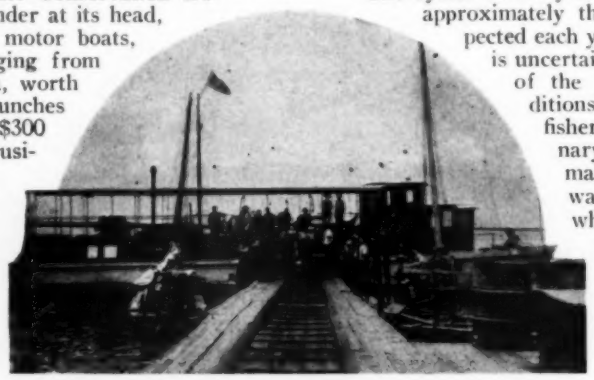
Louisiana, a small motor tug, handling a barge load of oyster shells for ultimate use on the highways

Elmira, cabin cruiser belonging to John Irwin of New Orleans, who has traversed most of the inland waterways

Bienville Street Landing, New Orleans, with an average day's motor freighter fleet tied up

reports have not been made on the new Government order registering all boats from 20 tons upward, and the old order including only those of 50 tons or more, but after much discussion with motor boat operators and outfitters it appears to the writer that about 900 of these boats are engaged in the various branches of the sea-food industry and as freight- and passenger-carriers, while the remainder are divided among the various types of the miscellaneous work boats. Approximately $1,500,000 is invested in the fleet, and their earnings range from $1,000 a year for the smaller ferries to $25,000 to $30,000 for the larger freight-carriers. Many a large family is supported and its children educated on the income from one of these boats.

To care for the industries in which these boats play so prominent a part, to safeguard the fisheries and the shrimp and oyster beds, and to see that the natural resources of the state are kept in their best producing condition, the Louisiana State Conservation Department, with M. L. Alexander at its head, maintains a fleet of twelve motor boats, valued at $50,000, and ranging from the large cruiser Alexandria, worth $25,000 down to the little launches Coot and Teal, worth about $300 each. They are among the busiest of the work boats of all Louisiana's fleet, and their services save uncounted millions of dollars to the state yearly, as well as many lives in periods of storm.



Louisiana State Conservation Department's Motor Cruiser Alexandria, inspecting oysters at a lower coast fishing village

The fishing fleets, some of which are owned by the large oyster and shrimp canneries on the Mississippi coast, but which are licensed in Louisiana and operate exclusively in the Louisiana marshes, are made up of auxiliary schooners, ranging up to 75 tons and as low as 3 or 4 tons; motor trawlers, introduced only recently; oyster luggers with a little "kicker" of 8 or 9 h.p., usually a Gray, single-cylinder, in the stern; small open launches for the tongers, who, filling their boats with oysters from the shallow water beds, carry them to the luggers, which, in turn, when filled, make the trip to the market or the cannery; and the narrow, shallow draft, high-speed, oyster, shrimp and fish runners, which, with their engines set far aft and the whole forward part of the hull packed with ice, make quick time through the bayous and canals or up the river to New Orleans, working altogether for the fresh market.

In this fleet it seems as if every boat owner has his pet engine. Wintons, Wolverines, Frisbies, Grays, Fairbanks-Morse, Automatics, every kind of a heavy-duty power plant known to the builders of internal combustion engines is to be found in this fleet, and every owner is ready to back his engine as the best. Apparently there is little choice, for they all work in all kinds of weather, in all kinds of water, with the same variation of loads, and all deliver the goods. Indeed, the gasoline and oil engine have raised the fishing industry of Louisiana from comparatively nothing in ten years to one of the leading income producers of the state.

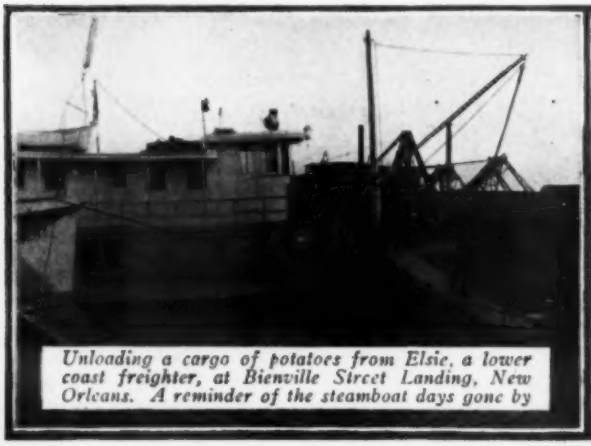
The shrimp and oyster fisherman usually owns his own boat, even up to the big shrimp schooners and the oyster luggers, and is paid by the barrel or by the pound for his shrimps and by the hundred for his oysters. This means that he takes better care of his engine and of his boat than he would if the craft belonged to some one else and the fisherman merely paid to care for it.

The oyster industry is a steady occupation, with approximately the same results to be expected each year, but the shrimp "crop" is uncertain, owing to tides, breeding of the shrimp and weather conditions during the season. Shrimp fishermen figure on two ordinary years, on which they make merely a fair living wage, and then one year in which the boat owner will clear from $5,000 to $10,000, and his crew, who work usually on shares with him, will be proportionately prosperous.

More than 12,000 men are employed in the fish, oyster and shrimp industry directly tributary to Louisiana. Were it not for the motor boat, half this number would be unable to find employment in it. Even with the constantly increasing number of motor craft employed in this work, it is difficult to get men to supply the demand, and all sea food has risen rapidly in price in New Orleans and other southern markets, largely because the labor cannot be obtained to harvest the crop from the waters of the southern section of the state and the gulf.

Louisiana, with an area of 45,966 square miles, has 2,328 square miles of bays, bayous, lakes, lagoons, and rivers. She has 4,794 miles of navigable waters, more than those of any other state in the Union, and all but four of her sixty-four parishes (counties) are reached

(*Continued on page* 58)



Unloading a cargo of potatoes from Elsie, a lower coast freighter, at Bienville Street Landing, New Orleans. A reminder of the steamboat days gone by

Loading Paul, one of the oldest and most profitable motor freighters in Louisiana, with flour for the interior of the state, at a New Orleans landing

Gasoline in Abundance for All Times

Why the Great Demands Made Upon the Petroleum Supply by the War Will Not Affect Its Future Uses in the Slightest

By A. Sheldon Clark
Vice-President Sinclair Refining Co.

Many rumors have been afloat especially during the war period as to the probable length of time our supply of gasoline would last, particularly if it was obliged to meet such ever-increasing demands to which it has been subjected during the last eighteen months. Mr. Clark, the writer of this article, is qualified to speak with the greatest authority. Besides being a vice-president of one of our biggest oil companies, Mr. Clark is a motor boatman and racing man of considerable note. He is responsible for all the big motor boat races which Chicago has had for many a year. Therefore, when he tells us that there will be enough gasoline for all forever and ever we can well believe the situation is far from serious.—EDITOR.

THE petroleum situation after the war, particularly as affecting fuel oil and gasoline, is an absorbing topic, not only amongst so-called oil men, but is most interesting from a commercial viewpoint as well. That production has not kept pace with consumption, is a fact, but it must not be understood that production in this country has decreased, for the contrary is true. The discrepancy arises principally from the larger percentage of increased demand over supply during the last four years.

Shortly after the World War commenced, production in the oil fields of Europe was curtailed, as far as the Allies were concerned. This, coupled with new demands which the war created, imposed a considerable burden upon the United States and Mexico. That this country was able to supply all the requirements imposed upon it reflects everlasting honor and credit to the men engaged in the oil industry. Our Government, soon after its entrance in the great struggle, realizing the importance of maintaining constant and adequate supplies to its Allies, appointed an oil director, in the person of Mark L. Requa, and through him, with the assistance of the National War Service Petroleum Committee, which is composed of the leading oil men of this country, the industry has been carried on during this critical period of the world's history in such a way that only praise can be attached. The phenomenal conditions imposed upon the industry have brought about a state of affairs at once unique, and for want of a better term, one might say unnatural, so far as marketing conditions are concerned. The patriotic spirit evinced by the industry as a whole is remarkable in more ways than one, and is a shining example of what a body of men, moved by common impulse, may accomplish. Without this unanimous response to the demands of the Government and the country's needs, the results achieved would have been impossible, and history will undoubtedly record the fact that the oil men of America met the situation magnificently, keeping the wheels of commerce moving smoothly and with a minimum of friction. This cooperation on the part of all working for a common cause, for the time being, obliterated competition and created an unheard of situation between jobbers and large distributors of the product. These conditions naturally can not be permanent and what the return to normal will mean to the industry is a question still to be answered. At the risk of being accused of speaking in platitudes however, I am constrained to say I feel that competition is the life of trade, and that these conditions will right themselves.

A. Sheldon Clark, motor boat racing man and authority on the petroleum industry and gasoline situation

While it is true that many new avenues have been opened up during the war for the use of petroleum, which will soon cease, on the other hand there are many commercial uses which have been temporarily suspended and which will be vigorously reopened after the war. While heretofore the uses for gasoline and other petroleum products have been limited, each day is finding new demands for its use. The rapid growth of the automobile industry has increased the demands for lighter oils, which formerly were considered a waste product, until now gasoline is one of the chief products of the industry. Modern farming efficiency demands the use of the tractor until today the farm without a tractor is what a farm without a team of horses would have been a few years ago. The war has opened up wonderful possibilities in the use of the airplane and a

(*Continued on page* 64)

Motor Manufacturers Predict a Banner Season

The Thoughts and Ideas of Some Members of the Industry— The Reconstruction Period to Be One of Boating Activity

A Look Ahead

IT isn't a bad plan for an individual or an industry to sit back once in a while and ask itself: "In what direction am I headed?"

The question isn't so much where do we stand as which way are we moving?

It matters very little whether we are running with the wind or against it, the main thing is how is the old engine hitting, how much gas have we got, and are there any rocks in the channel?

Just at present the marine engine industry would do well to lay off its continuous heaving of the lead, post a good lookout up forward and throw the throttle wide open. We have just rounded the turn, and pretty soon we are going to need all the headway we can gather.

The war is over. The task of changing back to a peace footing is no longer a dim and misty contingency. It looms up dead ahead, clear-cut, distinct.

What are we going to do to meet the needs of the times?

Are we going to let the boys from the battleships and the sub chasers forget the water because we will not take the trouble to show them how it can be reached via motor boat?

Are the boat and engine people going to settle back into the old slow-poke repining days or have we developed a go-getter spirit which will put the sport in its rightful place? Will the boat industry emerge from the war a "piker" or a "plunger"? That's the question!

While nothing could be more contrary to the traditions of the Buffalo Gasoline Motor Company than the kind of "plunging" which simply seeks to create spectacular effect, we certainly do not propose to be "pikers".

Never for a minute during the time of war stress have those who direct the destinies of the company forgotten that they have a sacred obligation to the motor boat field. Though they have been busy with other things—busy to a point which might be termed an almost frantic effort to turn out stuff for Uncle Sam—they have never forgotten the needs of Buffalo owners and Buffalo buyers or failed to care for them.

Not by one dollar did they curtail the advertising by which they have kept the old Buffalo standard flying while many of the boys were away and business was dull.

Not for a moment have they loosened their finger on the pulse of the industry, and now that it beats stronger they are ready to act.

In the race for post bellum business which is here they will not lag at the post. Their organization is intact, their factory has greater capacity than it ever had before. Experience on Uncle Sam's work has in no way impaired their ability to turn out marine engines.

Like youngsters back for the first day of school they welcome the return to the old peace time industry.

They will put into practice some of the plans which cannot be whispered now. They will expand their already large export trade until it covers the world like a blanket.

But there is another thing the builders of Buffalos wish to do. It is to spread the story of motor boating as a delightful sport. They believe that thousands of people do not own boats because they have never thought much about the water. They are afraid that many a sailor boy fresh from the navy will forget the ways of the sea because no one suggests to him that a motor boat will keep him in touch.

And this is no more their concern than the concern of all the other boat and engine manufacturers, of every boat lover.

The war has given us a clean start.

There will be a demand for motor boats whether we develop it or not, for thousands have learned to love the water who never knew it before.

But why be content with the business that comes to us?

Why not turn it into a big country-wide movement, a world-wide movement, for the demand abroad will be as it never was before. All that is necessary is publicity backed by strong sales effort applied to products that are "right".

C. B. McCuaig,
Buffalo Gasoline Motor Co., Buffalo, N. Y.

Fuel Problem Important

DURING the last year and a half the engineering departments of the marine motor manufacturers have had, owing to war conditions, a chance to work possibly a little more leisurely and to do more research work than they have been afforded an opportunity in the past. The results of this study and investigation will be most noticeable in the motors of the next two or three years. Not that we believe there will be any radical or startling changes as regards design and construction but there will be a noticeable refinement of details with an economy of fuel consumption, reliability and cleanliness in view. The motor boatmen are certainly going to reap the benefit of these well spent energies.

With the cessation of hostilities, and the war now being drawn to a close, motor boating should show a tremendous increase. We feel there are many now in the service of our country who are having their first experience in navigation and in the use of power boats. Any American with red blood in his system is certainly the foundation for a motor boatman and the start in the right direction which these men have gotten in Uncle Sam's service is certainly not going to die a sudden death. Boats will be bought by those who have never owned a craft before. Those who have sold their boats on entering the service will now be in the market for new ones and as Uncle Sam has always insisted on the best, it would seem that the demand is going to be for as good a craft as their pocketbook can afford. The economic values of the waterways as a means of transportation are coming more strongly to the fore every day and there is today a marked increase in the demand for boats as inland freight carriers.

The various types of motors will have their call, the high-speed, medium- and the heavy-duty types. We ourselves cannot help but feel that the greater demand will be for the medium-duty line. Reliability is more greatly to be desired than extreme speed and we think that this is a point which will be strongly considered by those who are starting in with their first motor boat. Also many of those who have had an extremely high-speed type of cruiser are seriously considering an outfit which is not so sensitive but possibly more reliable and embodying more comfort than the more powerful craft previously owned by them.

The fuel problem is one which is having a tremendous amount of attention at the present time. Many thousands of dollars are being expended in research and

(*Continued on page* 80)

AFTER-THE-WAR MARINE MOTORS

With Peace Comes Resumption of Production
Many Motors Now Ready for Delivery

An Alphabetical List of Marine Motors with the Names and Addresses of Their Manufacturers and the Horsepower and Characteristics of the Various Motors Which Are Now Available for Next Year's Needs

The initials used in the column under Location of Valves have the following meaning: L, both inlet and exhaust valves on same side of cylinder; T, inlet and exhaust valves on opposite sides of cylinder; S, valves in side of cylinder wall; H, valves in cylinder head.

The initials used in the column under Ignition indicates the standard equipment supplied, and have the following meaning: B, battery ignition; M B, make and break system with battery and coil; M B M, make and break system with low-tension magneto; J S, jump spark battery and coil system; D, jump spark battery system with non-vibrating coil and distributor; M, high-tension magneto; D & M, both battery distributor and high-tension magneto systems; O, purchaser has option of make and break or jump spark systems. The meaning of the initials used under the ignition column for the Diesel and heavy-oil motors are fully explained at the bottom of the list of these motors, but the initials used under the Port and Valves columns are the same as for gasoline motors.

Name of Motor	Name of Manufacturer
Arcadia	Acadia Gas Engines, Ltd., Bridgewater, Nova Scotia 3, 4, 5, 6½, 8, 10, 13, 15, 16, and 24 H. P.*
Acme	Acme Engine Co., San Francisco, Cal. 8, 10, 16, 20, 25, 27, 35, 45, 50, 55, 60, 65, 80, 85, 100, and 125 H. P.
Aerothrust	Aerothrust Engine Co., La Porte, Ind. 3, and 5 H. P.*
Airdrive	Kemp Machine Wks., Muncie, Ind. 12, and 24 H. P.
American	American Engine Co., Detroit, Mich. 2, 4, 6, 8, 14, 20, and 30 H. P.*
Anderson	Anderson Engine Co., Chicago, Ill. 4, 6, 8, 12, 24, 50, and 100 H. P.
Aristocrat	Caille Perfection Motor Co., Detroit, Mich. 14 H. P.
Aristox	Black Rock Mfg. Co., Bridgeport, Conn. 12 H. P.*
Arrow	Arrow Motor & Machine Co., New York, N. Y. 4 H. P.*
Automatic	Automatic Machine Co., Bridgeport, Conn. 3, 6, 9, 12, 18, 24, 25, 30, 37, 40, 45, 50, 60, 70, 75, 90, 100, 105, 120, 150, 200, and 250 H. P.
Barber	Barber Bros., Syracuse, N. Y. 2½, 4, 5, 6, 8, 9, 12, 18, 24, 27, 36, 40, and 60 H. P.*
Barker	Barker Factory, Norwalk, Conn. 1¼, 2½, 4, 6½, 8, and 10 H. P.*
Brennan	Brennan Motor Mfg. Co., Syracuse, N. Y. 20, 35, 40, 50, 60, and 80 H. P.
Bridgeport	Bridgeport Motor Co., Bridgeport, Conn. 4½, 6, 8, 9, 11, 12, 16, and 22 H. P.* 24, 36, and 50 H. P.
Brown-Talbot	Brown-Talbot Machinery Co., Salem, Mass. 5, 10, 15, 20, and 30 H. P.*
Bud-E	Carlyle Johnson Machine Co., Manchester, Conn. 5 H. P.*
Buffalo	Buffalo Gasoline Motor Co., Buffalo, N. Y. 4, 6, 12, 15, 20, 22, 24, 30, 45, 60, 70, 80, 100, and 150 H. P.
Burnoil	Burnoil Engine Co., South Bend, Ind. 12½, 25, 37½, 50, and 75 H. P.†
Capitol	Auto Engine Wks., Inc., St. Paul, Minn. 25, 32, 50, and 65 H. P.
Carl	Carl Engine Wks., Philadelphia, Pa. 8, 13, 15, 16, 28, and 32 H. P.
Chesapeake	Chesapeake Engine Co., Oxford, Md. 7, and 14 H. P. 6, and 12 H. P.*
Clay	Clay Engine Mfg. Co., Cleveland, O. 4, 6, 8, 10, 12, 16, 20, 25, 35, 50, and 100 H. P.
Clifton	Clifton Motor Wks., Cincinnati, O. 14, 21, 28, 60, 65, and 90 H. P.
C-O	Fairbanks, Morse & Co., Chicago, Ill. 30, 45, 60, 75, 100, 150, and 200 H. P.*†
Cottrell-Holmes	C. B. Cottrell & Sons Co., Westerly, R. I. 350 H. P.
Craig	James Craig Eng. & Mach. Wks., Jersey City, N. J. 150, 200, 250, 300, 350, 360, 400, 500, and 600 H. P.†
Doman	H. C. Doman Co., Oshkosh, Wis. 7, 12, 40, 55, and 85 H. P.
Duesenberg	Duesenberg Motors Corp., New York, N. Y. 260, and 360 H. P.
Eagle	Torrington Co. (Standard Plant), Torrington, Conn. 1½, 3½, 5, 5½, 6, 7, and 12 H. P.*
Elco	Elco Wks., Bayonne, N. J. 65, and 100 H. P.
Enterprise	Enterprise Foundry Co., San Francisco, Cal. 30, 35, 40, 55, 60, and 80 H. P.
Evansville	Evansville Gas Engine Wks., Evansville, Ind. 3¾, 5, 7½, 8, 10, 11, 15, 16, 20, 22, 24, 32, and 44 H. P.
Evinrude	Evinrude Motor Co., Milwaukee, Wis. 2, 3½, and 4 H. P.* 4 H. P.
F & B	Fay & Bowen Engine Co., Geneva, N. Y. 10, 15, 17, 20, 22, 28, 30, 35, 45, 50, and 75 H. P. 5, 7½, 10, 15, and 20 H. P.*
Fisherman	Loane Engineering Co., Baltimore, Md. 6, and 12 H. P.
Frisbie	Frisbie Motor Co., Middletown, Conn. 5, 7, 10, 16, 18, 25, 30, 40, 50, and 75 H. P.
Frisco Standard	Standard Gas Engine Co., Oakland, Cal. 4, 5, 7, 8, 10, 12, 16, 20, 25, 30, 40, 50, and 80 H. P.
Fulton	Fulton Mfg. Co., Erie, Pa. 5, 6, 8, 9, 10, 12, 16, and 18 H. P.* 50, 70, and 100 H. P.†
Gaeth	Gaeth Motor Co., Cleveland, O. 18, 27, 36, 50, 54, and 75 H. P.
Gray	Gray Motor Co., Detroit, Mich. 3, 5½, 6, and 11 H. P.* 12, and 24 H. P.
Gray-Prior	Gray & Prior Machine Co., Hartford, Conn. 36 H. P.
Guarantee	Guarantee Motor Co., Hamilton, Ont., Can. 3, 5, 6, 7, 9, 10, 11, 14, 18, and 22 H. P.* 4, 7, 8, 10, 14, 16, 20, 25, and 35 H. P.
Gulowsen Grel	M. H. Tracy Co., 17 State St., N. Y. C. 7, 10, 15, 22, 30, 45, 60, 80, 110, 130, 180, 240, and 360 H. P.*†
Harris	Harris Engine Co., Wilmington, Del. 10, 15, 20, 45, 60, 65, 75, 85, 125, 150, and 225 H. P.
Hartford	Gray & Prior Machine Co., Hartford, Conn. 5, 8, 10, and 20 H. P.*
Hettinger	Hettinger Engine Co., Bridgeton, N. J. 6, 9, 12, 18, 25, 36, and 50 H. P.
Hunter	Everett Hunter Boat Co., McHenry, Ill. 10, and 12 H. P.
Imperial (Canard)	Bruce Stewart Co., Ltd., Charlottetown, P. C. I., Can. 4, 5, 10, 15, 20, and 30 H. P.* 40 H. P.
Joymotor	Joymotor Mfg. Co., Chicago, Ill. 2 H. P.
Kahlenberg	Kahlenberg Bros., Co., Two Rivers, Wis. 3, 4, 6, 8, 12, 15, 16, 24, 30, 36, 45, 54, 55, and 85 H. P.* 70, 100, and 130 H. P.*†
Kermath	Kermath Mfg. Co., Detroit, Mich. 12, 16, and 20 H. P.
Knox M. Co.	Knox Motors Co., Springfield, Mass. 40 H. P.
Knox	Camden Anchor-Rockland Machine Co., Camden, Me. 3, 4½, 5½, 6, 7½, 9, 11, and 15 H. P.* 25, 50, and 75 H. P.
Koban	Koban Mfg. Co., Milwaukee, Wis. 3 H. P.*
L-A	Lockwood-Ash Motor Co., Jackson, Mich. 2½, 4, 6, 8, and 12 H. P.* 14 H. P.
Lathrop	J. W. Lathrop Co., Mystic, Conn. 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, and 36 H. P.* 12, 16, 21, 30, 28, and 40 H. P.
Lisk	Geo. A. Lisk Machine & Tool Wks., Detroit, Mich. 5, 12, 18, 26, 40, and 60 H. P.
McIntosh	McIntosh & Seymour Corp., Auburn, N. Y. 300, 500, 750, 1,000, and 1,350 H. P.†
Mianus	Mianus Motor Wks., Stamford, Conn. 3, 5, 6, 7½, 10, 12, 15, and 20 H. P.* 16, 24, and 32 H. P.
Miller	Miller Engine Co., Chicago, Ill. 4, 6, 10, 14, 20, 22, 30, 35, and 50 H. P.
Missouri	Missouri Engine Co., St. Louis, Mo. 7, 14, 22, and 30 H. P.* 4, 8, 12, 18, 24, 36, 40, and 60 H. P.
Mohawk	S. R. Mfg. Co., Schenectady, N. Y. 3½, 5, 6, 7, 10, 12, 16, 18, 21, and 30 H. P.*

***Indicates two-cycle motors**

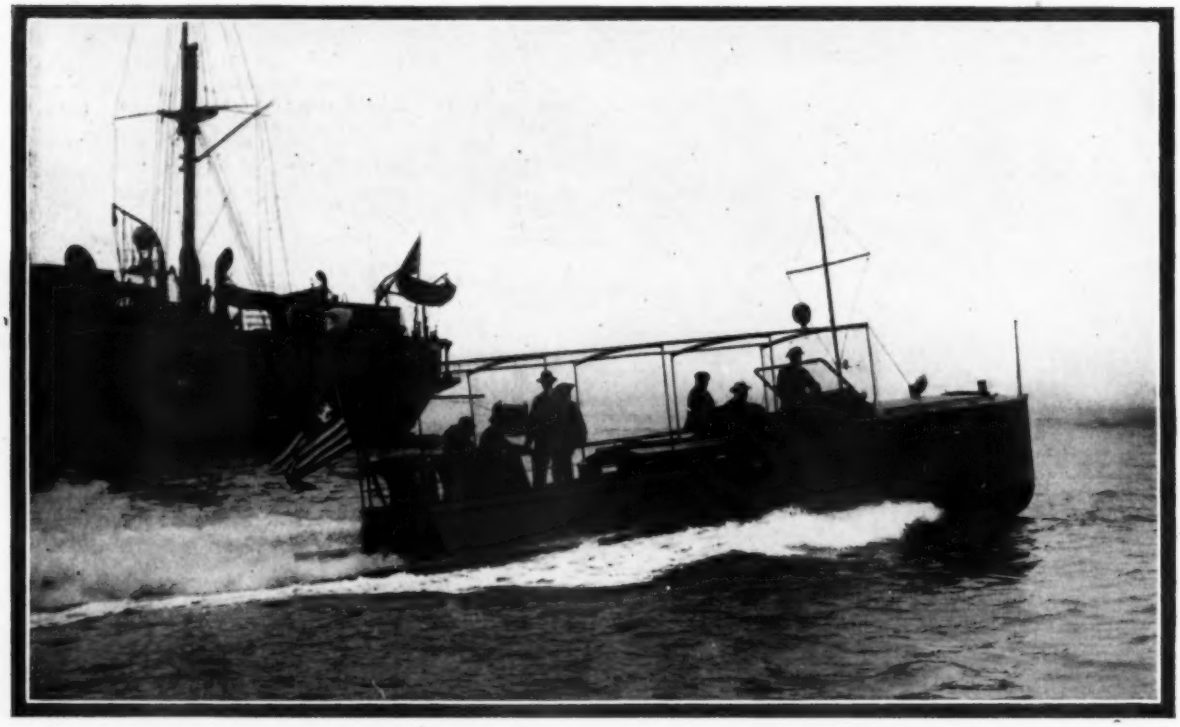
† Indicates Diesel or oil motors

AFTER THE WAR MARINE MOTORS—(Continued)

Name of Motor	Name of Manufacturer
Morton	Peninsular Auto Parts Co., Detroit, Mich. 20 H. P.
Motorgo	Sears, Roebuck & Co., Chicago, Ill. 1¼, 2½, 4, 6, and 8 H. P.* 20 H. P.
M. & T.	Murray & Tregurtha Co., South Boston, Mass. 4, 6, 11, 14, 18, 24, 28, 30, 40, 60, 80, 90, 95, 100, 125, 175 and 400 H. P.
M. & S.	N. & S. Engine Co., Seattle, Wash. 20, 30, and 40 H. P.
Niagara	Niagara Motors Corp., Dunkirk, N. Y. 8, 10, 14, 15, 25, 45, 60, 80, 100, 150, and 200 H. P.
Nieland	Nieland, J. E., Co., San Francisco, Cal. 1½, 2, 2½, 4, 6, 8, 12, 16, 18, 20, and 24 H. P.
Niseco	New London Ship & Engine Co., Groton, Conn. 60, 120, 180, 240, and 360 H. P.†
Palmer	Palmer Bros., Cos Cob, Conn. 2, 2½, 4, 5, 5½, 6, 7½, 10, and 12 H. P.* 5, 6, 6½, 11, 12, 15, 18, 20, 24, 25, 26, 35, 50, 60, and 80 H. P.
Peerless	Peerless Marine Motor Corp., Buffalo, N. Y. 6, 12, 20, 24, 35, and 50 H. P.
Perfection	Caille Perfection Motor Co., Detroit, Mich. 2½, 4, 6, 8, 14, 18, 20, and 30 H. P.*
Porto	Arrow Motor & Machine Co., Inc., New York, N. Y. 2 H. P.*
Quayle	Commonwealth Motors Co., Chicago, Ill. 25 H. P.†
Ralaco	S. M. Jones Co., Toledo, O. 10, 15, 20, 25, 30, 45, 60, and 80 H. P.
Red Wing	Red Wing Motor Co., Red Wing, Minn. 20, 24, 36, and 40 H. P.
Regal	Regal Gasoline Engine Co., Coldwater, Mich. 2, 4, 5, 7, 8, 9, 10, 14, 18, 20, 30, 32, 36, and 50 H. P.
Reliable	Reliable Engine Co., Portsmouth, O. 10, 16, 25, and 45 H. P.
Roberts	Roberts Motor Mfg. Co., Sandusky, O. 4, 8 and, 16 H. P.* 8 H. P.
Scripps	Scripps Motor Co., Detroit, Mich. 20, 35, 45, 50, and 75 H. P.
Skandia	Skandia Pacific Oil Engine Co., Oakland, Cal. 7, 9, 13, 16, 17, 20, 22, 24, 30, 36, 38, 48, 50, 55, 60, 70, 100, 120, 140, 180, 200, 240, 360, and 500 H. P.*†
Smalley	Smalley-General Co., Bay City, Mich. 6, and 15 H. P.*
Snapper	Automatic Mach. Co., Bridgeport, Conn. 3 and 5 H. P.*
Speedway	Gas Engine & Power Co. & Chas. L. Seabury & Co., Cons' Morris Heights, N. Y. 28, 44, 66, 75, 115, 130, 150, 160, 175, 200, and 250 H. P.
Standard	Standard Motor Const. Co., Jersey City, N. J. 12, 18, 24, 27, 37, 54, 75, 100, and 150 H. P.
Standard Kid	Chandler Dunlap Co., Seattle, Wash. 3, and 6 H. P.
Stanley	Stanley Co., Boston, Mass. 3, 6, 7½, 14, and 15 H. P.*
Sterling	Sterling Engine Co., Buffalo, N. Y. 10, 15, 25, 55, 85, 100, 115, 125, 145, 170, 200, 250, and 300 H. P.
Toledo	Universal Machine Co., Bowling Green, O. 3, 6, 7, 12, and 18 H. P.*
20th Century	New York, Yacht. Launch & Engine Co., Morris Heights, N. Y. 20, 50, and 75 H. P.
Union	Union Gas Engine Co., Oakland, Cal. 5, 8, 12, 16, 20, 30, 35, 40, 45, 50, 60, 80, 85, 110, 125, 150, 225, 250, 300, 325, and 375 H. P.
Universal	Universal Motor Co., Oshkosh, Wis. 12 H. P.
Van Blerck	Van Blerck Motor Co., Monroe, Mich. 100, 150, and 200 H. P.
Vim	Vim Motor Co., Sandusky, O. 5, 6, 9, 10, 12, 15, 18, 23, 25, and 27 H. P.*
Vulcan	Vulcan Engine Wks., Philadelphia, Pa. 4, 5, 7½, 8, 10, 11, 15. 16, 20, 22, 25, 30, 35, 40, 45, 56, 70, and 75 H. P.
Winton	Winton Engine Wks. Cleveland, O. 50, 80, 125, and 200 H. P. 200, 300, and 450 H. P.†
Wisconsin Cons.	Wisconsin Motor Mfg. Co., Milwaukee, Wis. 18, 22, 24, 30, 40, 42, 46, 54, 55, 57, 62, 65, 80, 85, and 90 H. P.
Wisconsin Oil	Wisconsin Motor Mfg. Co., Milwaukee, Wis. 60, 90, and 120 H. P.*†
Wisconsin	Wisconsin Machinery & Mfg. Co., Milwaukee, Wis. 2, 3½, 5, 7, 8, 14, 18, 25, and 35 H. P.*
Wolverine	Wolverine Motor Wks., Bridgeport, Conn. 5, 12, 14, 20, 22, 32, 40, 42, 60, 80, 110, 160, and 200 H. P
Wood & Chute	Wood & Chute, Inc., Greenport, N. Y. 16, 24, and 32 H. P.
Wright	Wright Machine Co., Owensboro, Ky. 18, 30, 40, 45, 62, 65, and 90 H. P.

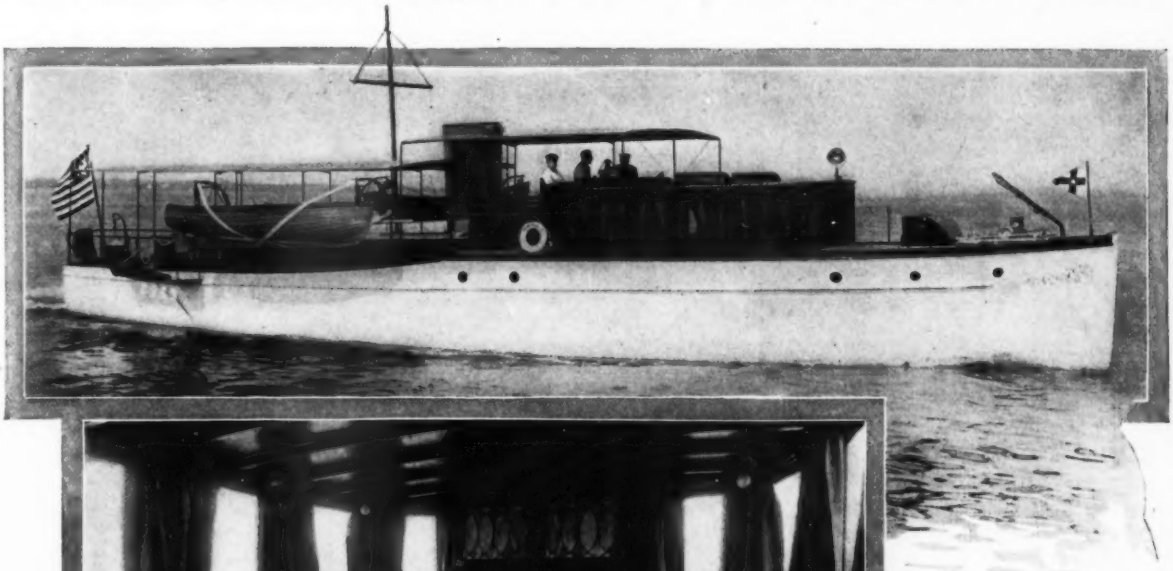
(*Tables continued on page 23*)

NOTE:—All lines marked * indicate two-cycle motors
All lines marked † indicate Deisel or heavy oil motors
Motors in lines not marked * or † are four-cycle



The demand for stock cruisers is going to be enormous. Those built by the Albany Boat Corporation are speedy and up-to-date in every particular

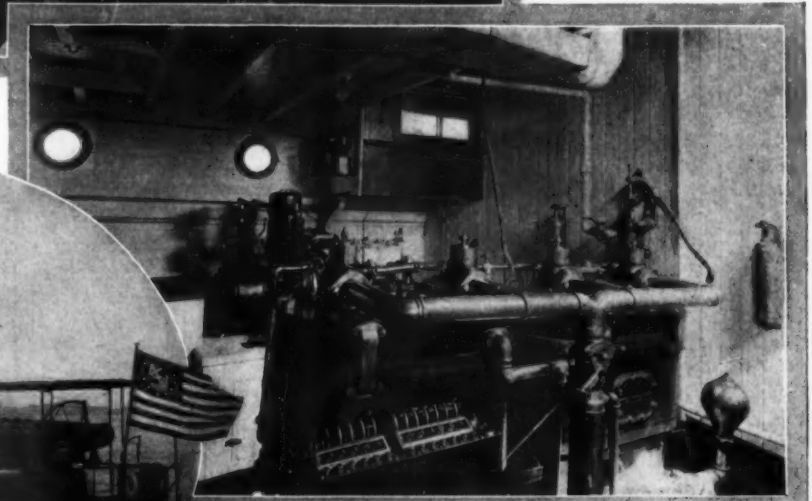
Sinbad IV, a Sixty-seven Foot Motor Cruiser

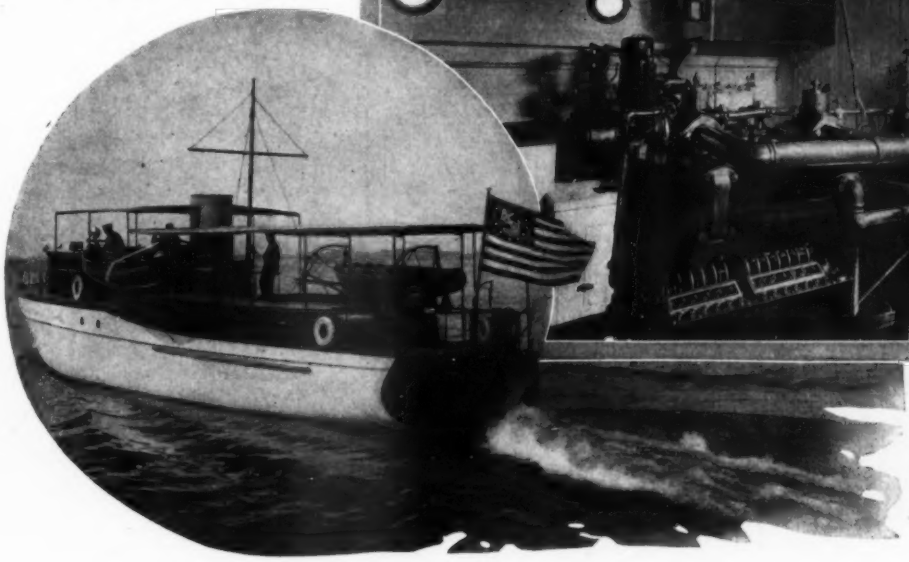


Sinbad IV, a new raised-deck cruiser, is owned by Gardiner B. Williams, of Boston. She is 67 feet in length on the waterline, has a beam of 13 feet, and a draft of 4 feet. Her power plant is a four-cylinder 65-75 h.p. Standard motor

Photographs by F. G. Spencer

The designer and builder of Sinbad IV is Frederick S. Nock, of East Greenwich, R. I.





Cruisers with real accommodations are going to be the trend from now on; Sinbad IV is an excellent example of this type

Picking the Proper Power Plant

An Intelligent Analysis of the Many Conditions Which Must Be Studied Before Reaching a Correct Conclusion—More Than Statistics and Catalogues Necessary

By T. W. Rockwell

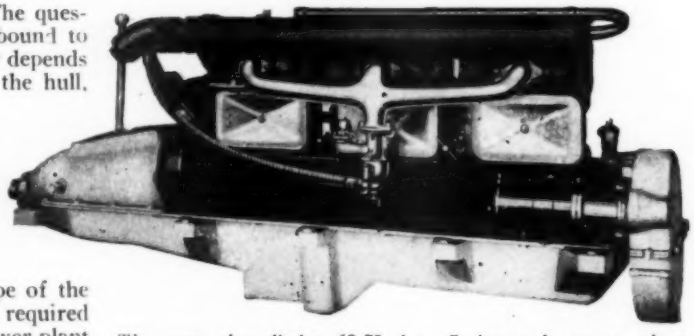
In this issue of MoToR BoatinG an immense amount of data concerning all the reputable and reliable makes of American Marine Motors is tabulated. Enough information is given to permit one familiar with motor boat practices to make the selection of the most ideal power plant for his particular boat and outfit. On pages 19 and 20 will be found a list of the names of the engine manufacturers, their addresses and a complete record of the horsepowers of the motors which they build. Thus if a prospective buyer is partial to a particular make of motor, he can determine from those pages the various sizes of motors built by the particular manufacturer.

On pages 23 to 28 will be found a list of all motors built recorded in the order of their powers. Therefore, should one desire a motor of say 12 horsepower, he can at once locate all the motors of that particular power which are built and then take his choice as to the one which suits his case best. Full information as to bore, stroke, number of cylinders, cycle, etc., is also given in these tables.

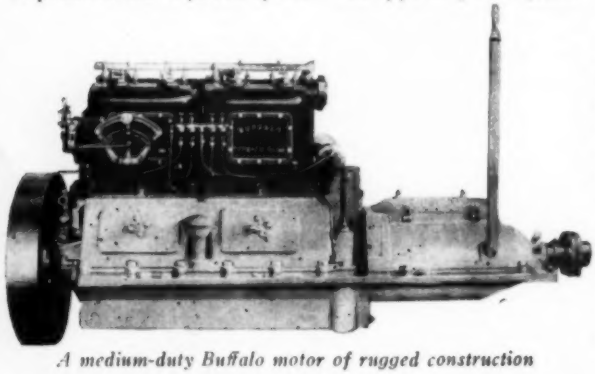
It should not be assumed that the proper power plant can be selected alone by the use of statistical tables and figures, for such is not the case. The judgment of the buyer is a most important factor. The opinion and advice of the manufacturer is also of great value and should be obtained in every case.—Editor.

WHAT power plant will give the best results in my boat? What horsepower motor will give my boat the highest speed with the greatest economy? These are but two of many similar questions that are being asked every day by a host of motor boat owners. The questions are direct enough, but the answers are bound to contain a great many ifs and buts. The answer depends upon three principal factors. The design of the hull, the propeller, and the speed to be obtained. Besides these there is the question of fuel, the purpose for which the boat is used and the character of the waters on which the boat is to be used.

Of the three principal factors there are two variables, propeller and speed, but the third, the lines of the hull, cannot be changed. So it will be necessary to work from the shape of the hull to determine the horsepower and propeller required to produce the required speed. The type of power plant



The new six-cylinder 60-75 h.p. Scripp unit power plant



A medium-duty Buffalo motor of rugged construction

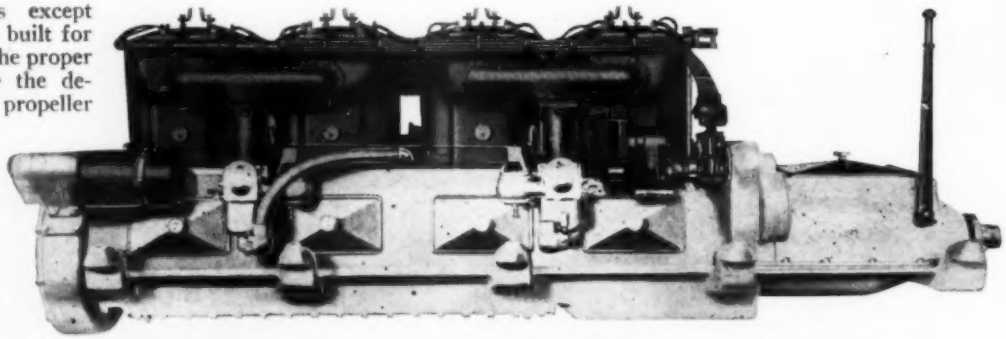
will be determined almost solely by the shape of the hull and the purpose for which the boat is to be used. In this discussion we will consider that there are three types of power plant. High-speed, medium-duty, and heavy-duty.

In all cases except where a boat is built for speed, and has the proper lines to secure the desired result, the propeller will depend as much upon the hull as the engine installed. The question of propellers for different types of hulls was discussed in the July issue of MoToR BoatinG, and the conclusions derived in that article apply to any ordinary motor boat.

Before going any further into the question of power plants it should be understood that every boat has what might be called an economical speed and a maximum speed. The economical speed of a boat is reached at the point where the application of more power produces but a small increase in speed, an increase that is hardly worth the additional expense both in the first cost of the power plant and the additional amount of fuel used. Then again practically every boat has a certain maximum speed beyond which any amount of power will not drive it. The only result obtained by the additional power is to make the boat squat or throw an enormous amount of water sternward in the wake, or do both at the same time. Under these conditions it is readily seen that the proper motor to install will be one that will drive the boat only to the economical speed with possibly a ten or fifteen per cent. excess for such an emergency as towing or running into a head sea.

The proper type of power plant for a given boat is easily determined, and that will in a great measure fix

(Continued on page 25)



An egiht-cylinder 180-200 h.p. Model F high-speed Sterling motor with counterbalanced crankshaft

AMERICA'S TWO-CYCLE MOTORS
for Nineteen Nineteen

Two-Cycle Motors Under 6 Horsepower

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	2 or 3 Port	Ignition
1¼	Barker	1	3⅛x3½	600	110	..	.....
1¼	Motorgo	1	2⅝x2½	850	95	2	B.
1½	Eagle	1	3 x3	600	95	2	M. & B.
2	American	1	3 x3½	700	100	2	B.
2	Evinrude	1	2⅝x2½	700	45	2	M.
2	Palmer	1	3¼x3½	500	135	3	M. & B.
2½	Barber	1	3¼x3¼	750	75	3	J. S.
2½	Barker	1	4⅛x4¼	550	170	..	.....
2½	L-A	1	3¼x3½	750	...	2	J. S.
2½	Motorgo	1	3¼x3¼	750	97	2	B.
2½	Palmer	1	3¼x3½	700	125	3	J. S.
2½	Perfection	1	3¼x3½	700	140	2	B.
3	Acadia	1	4 x3½	550	...	..	M. B.
3	Gray	1	3½x3½	800	139	3	J. S.
3	Guarantee	1	3¼x3½	...	...	..	J. S.
3	Kahlenberg	1	3½x3½	600	125	2	M. B.
3	Knox	1	4 x4	600	205	2—3	O.
3	Lathrop	1	4 x4	550	...	2	O.
3	Mianus	1	4 x4	550	195	2	M. B.
3	Snapper	1	4¼x4	...	205	..	M. B.
3	Stanley	1	4 x3½	500	175	2	M. B.
3	Toledo	1	3½x3½	750	180	2	J. S.
3½	Eagle	1	3½x3¼	1,000	108	3	D.
3½	Mohawk	1	3½x3¾	900	...	..	J. S.
4	Acadia	1	4 x4	700	...	..	M. B.
4	American	1	3⅞x3½	800	150	2	B.
4	Barber	1	4 x4	600	150	3	J. S.
4	Barker	1	4⅛x5	550	220	..	.....
4	Evinrude	2	2⅝x2½	1,150	68	2	M.
4	Imperial(Canada)	1	4 x3½	500	220	3	J. S.
4	Kahlenberg	1	4 x4	550	160	2	M. B.
4	Lathrop	1	4½x5	500	...	2	O.
4	L-A	1	4 x4	750	...	2	J. S.
4	Motorgo	1	4 x4	750	135	2	B.
4	Palmer	1	4½x4½	450	240	2	M. B.
4	Palmer	1	4½x4½	650	210	3	J. S.
4	Perfection	1	3⅞x3½	800	150	2	B.
4	Roberts	1	3½x4	1,000	130	..	J. S.
4½	Bridgeport	1	4½x5	500	275	2—3	O.
4½	Knox	1	4¼x4½	550	250	2—3	O.
5	Acadia	1	4½x5	550	...	..	M. B.
5	Barber	2	3¼x3¼	750	150	3	J. S.
5	Brown-Talbot	1	4 x4	750	200	2	J. S.
5	Bud-E	2	3 x3	1,200	110	3	M.
5	Eagle	1	4½x4	800	210	2—3	O.
5	F. & B.	1	4½x4½	550	330	2	M. B.
5	Fulton	1	3¾x4	800	150	3	J. S.
5	Guarantee	1	4½x4½	...	...	..	J. S.
5	Hartford	1	4 x4½	700	220	2	M. B.
5	Imperial (Canada)	1	4½x4	500	280	3	J. S.
5	Lathrop	1	5⅛x5	500	...	2	O.
5	Mianus	1	4½x5	500	340	2	M. B.
5	Mohawk	1	4½x4½	500	...	..	M.
5	Palmer	2	3¼x3½	700	180	3	J. S.
5	Snapper	1	5¼x5	...	340	..	M. B.
5	Vim	1	4 x4	750	172	3	J. S.
5	Wisconsin	1	4 x4	700	220	3	J. S.
5½	Eagle	1	5 x6	450	470	2	O.
5½	Gray	1	4¼x4¼	800	240	3	J. S.
5½	Knox	1	5 x5¼	550	330	2—3	O.
5½	Palmer	1	5 x6	450	325	3	M. B.

6 to 10 Horsepower Two-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	2 or 3 Port	Ignition
6	American	1	4¾x4½	800	200	2	B.
6	Barber	1	4¾x4¾	600	245	3	J. S.
6	Bridgeport	1	5¼x5¼	500	310	2—3	O.
6	Chesapeake	1	5 x5	500	275	..	B.
6	Eagle	1	4½x4	900	220	3	D.
6	Eagle	1	4½x5	600	320	2	O.
6	Fulton	1	4½x5	600	200	3	J. S.
6	Gray	2	3½x3½	800	185	3	J. S.
6	Guarantee	2	3¾x3½	...	...	..	J. S.
6	Kahlenberg	1	5 x5	400	400	2	M. B.
6	Knox	2	4 x4	600	375	2—3	O.
6	L-A	2	3½x3½	800	...	2	J. S.
6	Lathrop	1	5¼x6½	400	...	2	O.
6	Lathrop	1	5½x5	500	...	2	O.
6	Mianus	1	4½x5	700	335	2	J. S.
6	Mianus	2	4 x4	550	355	2	M. B.
6	Mohawk	1	4½x3¾	1,200	...	..	M.
6	Mohawk	1	4½x4½	700	...	..	M.
6	Motorgo	2	3½x3½	750	154	2	B.
6	Palmer	1	5 x6	625	325	3	J. S.
6	Palmer	1	5 x6	400	350	2	M. B.
6	Perfection	1	4¾x4½	800	250	2	B.
6	Smalley	1	4½x4½	950	...	3	J. S.
6	Stanley	1	4½x5	500	290	2	M. B.
6	Toledo	1	4½x4½	750	300	2	J. S.
6	Vim	2	3½x3½	750	197	3	J. S.
6	Vim	1	5 x5	450	330	3	J. S.
6½	Acadia	1	5½x5	600	...	..	M. B.
6½	Barker	1	5½x6½	450	350	..	.....
7	Eagle	2	3⅝x3¾	1,000	190	3	D.
7	Eagle	1	6 x6½	400	625	2	O.
7	Guarantee	1	5 x5	...	...	..	J. S.
7	Lathrop	1	6 x6½	375	...	2	O.
7	Mohawk	1	4½x4½	900	...	..	M.
7	Mohawk	2	3½x3¾	900	...	..	M.
7	Toledo	2	3½x3½	750	300	2	J. S.
7	Wisconsin	1	4¼x4½	700	240	3	J. S.

6 to 10 Horsepower—(Continued)

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	2 or 3 Port	Ignition
7½	F. & B.	1	5½x5½	500	580	2	M. B.
7½	Knox	1	5½x6¼	550	500	2—3	O.
7½	Mianus	1	5⅛x6	450	490	2	M. B.
7½	Palmer	1	6 x6	400	375	2	M. B.
7½	Stanley	1	5½x6	425	350	2	M. B.
8	Acadia	1	5½x6	550	...	..	M. B.
8	Acadia	2	4 x4	700	...	..	M. B.
8	American	1	5¼x5	600	335	2	B.
8	American	2	3⅞x3½	1,000	280	2	B.
8	Barber	3	3¼x3¼	750	190	3	J. S.
8	Barber	2	4 x4	600	270	3	J. S.
8	Barker	2	4⅛x5	550	380	..	.....
8	Bridgeport	1	4½x5	800	275	2—3	O.
8	Fulton	1	4½x5	800	200	3	J. S.
8	Fulton	2	3¾x4	650	250	3	J. S.
8	Hartford	1	4½x4½	700	240	2	M. B.
8	Kahlenberg	1	5½x6	400	550	2	M. B.
8	Kahlenberg	2	4 x4	550	350	2	M. B.
8	L-A	2	4 x4	800	...	2	J. S.
8	Lathrop	1	6½x6½	375	...	2	O.
8	Lathrop	2	4½x5	550	...	2	O.
8	Motorgo	2	4 x4	750	222	2	B.
8	Perfection	1	5¼x5	600	335	2	B.
8	Perfection	2	3⅞x3½	800	280	2	B.
8	Roberts	2	3½x4	1,000	185	..	J. S.
8	Wisconsin	2	4 x4	750	300	3	J. S.
9	Barber	1	5½x5¼	550	270	3	J. S.
9	Bridgeport	2	4½x5	500	435	2—3	O.
9	Fulton	1	5½x6	500	300	3	J. S.
9	Guarantee	1	5½x5	...	...	..	J. S.
9	Knox	2	4¼x4½	600	380	2—3	O.
9	Vim	1	5 x5	700	285	3	J. S.
10	Acadia	2	4½x5	550	...	..	M. B.
10	Barker	1	6½x8	400	510	..	.....
10	Brown Talbot	1	5½x5	500	350	2	J. S.
10	Brown Talbot	2	4 x4	750	300	2	J. S.
10	F. & B.	1	6¼x6¼	475	810	2	M. B.
10	F. & B.	2	4½x4½	550	510	2	M. B.
10	Fulton	2	3¾x4	800	250	3	J. S.
10	Guarantee	2	4½x4½	...	...	..	J. S.
10	Hartford	1	5 x5¼	700	290	2	M. B.
10	Imperial, Canada	1	5½x6	800	590	3	J. S.
10	Imperial (Canada)	2	4½x4	500	420	3	J. S.
10	Lathrop	1	7 x7½	300	...	2	O.
10	Lathrop	2	5⅛x5	500	...	2	O.
10	Mianus	2	6½x7	375	815	2	M. B.
10	Mianus	2	4½x5	500	580	2	M. B.
10	Mohawk	2	4½x4½	500	...	..	M.
10	Palmer	2	4½x4½	650	325	3	J. S.
10	Vim	2	4 x4	700	270	3	J. S.

11 to 20 Horsepower Two-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	2 or 3 Port	Ignition
11	Bridgeport	1	5¼x5¼	800	310	2—3	O.
11	Gray	2	4¼x4¼	800	325	3	J. S.
11	Guarantee	1	6 x5	...	...	..	J. S.
11	Knox	2	5 x5¼	550	480	2—3	O.
12	Aristox	6	3⅛x3½	675	500	..	.....
12	Barber	1	6¼x6¼	500	400	3	J. S.
12	Barber	2	4¾x4¾	600	375	3	J. S.
12	Barber	3	4 x4	600	390	3	J. S.
12	Bridgeport	2	5¼x5¼	500	570	2—3	O.
12	Chesapeake	2	5 x5	500	550	2	B.
12	Eagle	2	4½x4	1,300	340	3	D.
12	Fulton	2	4½x5	600	350	3	J. S.
12	Kahlenberg	1	6½x7	350	750	2	M. B.
12	Kahlenberg	2	5 x5	400	650	2	M. B.
12	Lathrop	1	7½x7½	275	...	2	O.
12	Lathrop	2	5½x5	500	...	2	O.
12	Lathrop	2	5¼x6½	400	...	2	O.
12	L-A	2	4½x4½	750	...	2	J. S.
12	Mianus	2	4½x5	700	570	2	J. S.
12	Mohawk	2	4⅛x3¾	1,200	...	..	M.
12	Mohawk	2	4½x4½	700	...	..	M.
12	Palmer	2	5 x6	625	425	3	J. S.
12	Toledo	2	4½x4½	750	400	2	J. S.
12	Vim	2	5 x5	450	510	3	J. S.
13	Acadia	2	5½x5	600	...	..	M. B.
14	American	2	4¾x4½	700	350	2	B.
14	Guarantee	1	7 x7	...	...	..	J. S.
14	Guarantee	2	5 x5	...	...	..	J. S.
14	Lathrop	2	6 x6½	400	...	2	O.
14	Perfection	2	4¾x4½	800	350	2	B.
14	Stanley	2	5½x4½	600	495	2	O.
15	Acadia	3	4 x4	700	...	..	J. S.
15	Brown Talbot	3	4 x4	750	350	3	J. S.
15	Brown Talbot	1	7 x6¼	350	600	2	J. S.
15	F. & B.	2	5½x5½	500	900	2	M. B.
15	Imperial (Canada)	1	4½x4	500	500	3	J. S.
15	Kahlenberg	1	7 x8	325	900	2	M. B.
15	Knox	2	5½x6¼	500	700	2—3	O.
15	Mianus	2	5⅛x6	450	875	2	M. B.
15	Smalley	2	4½x4½	950	...	3	J. S.
15	Stanley	2	5½x6	425	641	2	M. B.
15	Vim	2	4 x4	1,100	265	3	M.
15	Vim	3	4 x4	700	340	3	J. S.
16	Acadia	2	5½x6	550	...	..	M. B.
16	Bridgeport	2	4½x5	800	435	2—3	O.
16	Fulton	2	4½x5	800	350	3	J. S.
16	Kahlenberg	2	5½x6	375	950	2	M. B.
16	Lathrop	2	6½x6½	400	...	2	O.
16	Mohawk	2	4½x4½	900	...	..	M.

America's Two-Cycle Motors for Nineteen Nineteen—(Continued)

11 to 20 Horsepower—(Continued)

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	2 or 3 Ports	Ignition
16	Roberts	4	3½x4	1,000	190	..	J. S.
18	Barber	3	4¾x4¾	600	500	3	J. S.
18	Barber	2	5½x5¼	550	535	3	J. S.
18	Fulton	2	5½x6	500	500	3	J. S.
18	Guarantee	2	5½x5	....	....	..	J. S.
18	Mohawk	3	4½x4½	700	....	..	M.
18	Perfection	4	3⅞x3½	1,000	378	2	M.
18	Toledo	3	4½x4½	750	500	2	J. S.
18	Vim	2	5 x5	700	450	3	J. S.
18	Vim	3	5 x5	450	689	3	J. S.
18	Wisconsin	3	4 x4	850	420	3	J. S.
20	American	2	5¼x5	600	495	2	B.
20	Brown Talbot	2	5½x5	500	600	2	J. S.
20	F. & B.	2	6¼x6¼	475	1,260	2	M. B.
20	Hartford	2	5 x5¾	700	440	2	M. B.
20	Imperial (Canada)	2	5½x6	500	825	3	J. S.
20	Lathrop	2	7 x7½	300	....	2	O.
20	Mianus	2	6½x7	375	1,390	2	M. B.
20	Perfection	2	5¼x5	650	495	2	B.

Two-Cycle Motors Over 20 Horsepower

Rated H.P.	Motor	No. of Cyls.	Bore & Stroke	H. P. M.	Wt.	2 or 3 Ports	Ignition
21	Mohawk	3	4¼x3¾	1,200	....	..	M.
22	Bridgeport	2	5¾x5¼	800	570	2—3	J. S.
22	Guarantee	2	6 x5	....	....	..	J. S.
23	Vim	3	4 x4	1,100	310	3	M.
24	Acadia	3	5½x6	550	1,050	..	J. S.
24	Barber	2	6½x6¼	500	695	3	J. S.
24	Kahlenberg	2	6½x8	350	1,300	2	M. B.
24	Lathrop	2	7½x7½	275	....	2	O.
25	Vim	2	5 x5	1,100	370	3	M.
25	Wisconsin	3	4½x4½	850	470	3	J. S.
27	Barber	3	5½x5¼	550	675	3	J. S.

Two-Cycle Motors Over 20 Horsepower—(Cont.)

Rated H.P.	Motor	No. of Cyls.	Bore & Stroke	H. P. M.	Wt.	2 or 3 Ports	Ignition
27	Vim	3	5 x5	700	614	3	J. S.
30	American	4	4¾x4½	850	595	2	M.
30	Brown Talbot	2	7 x6¼	350	1,000	2	J. S.
30	Imperial (Canada)	3	5½x6	500	1,100	3	J. S.
30	Kahlenberg	2	7 x8	325	1,800	..	....
30	Mohawk	3	4½x4½	1,200	....	..	M.
30	Perfoction	4	4¾x4½	850	595	..	M.
35	Wisconsin	4	4½x3½	1,000	580	3	J. S.
36	Barber	3	6½x6¼	500	925	3	J. S.
36	Kahlenberg	2	7¾x8	325	2,000	2	M. B.
36	Kahlenberg	3	6½x7	325	1,700	2	M. B.
36	Lathrop	3	7½x7½	275	....	2	J. S.
40	Barber	2	8 x8	350	1,950	3	J. S.
45	Kahlenberg	3	7 x8	325	2,600	2	M. B.
54	Kahlenberg	3	7¾x8	325	2,800	2	M. B.
55	Kahlenberg	2	9 x10	300	3,400	2	M. B.
60	Barber	3	8 x 8	350	2,850	3	J.S.
85	Kahlenberg	3	9 x10	300	5,000	2	M. B.

Outboard Motors

Rated H. P.	2 or 4 Cycle	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Ports or Valves	Ignition
2	2	Evinrude	1	2½x2½	700	73	2	M.
2	4	Joymotor	1	2½x2½	1,025	50	..	M.
2	2	Porto	1	2¾x3	800	55	3	M.
2	2	Wisconsin	1	2½x2½	700	55	2	J. S. or M
3	2	Aerothrust	2	2½x2¼	1,600	85	2	J. S.
3	2	Koban	2	2¾x2⅜	900	80	2	M.
3½	2	Evinrude	1	3½x3	550	116	2	M.
3½	2	Wisconsin	1	3¼x3¼	700	100	2	M.
4	2	Arrow	2	2¾x2½	800	95	3	M.
4	4	Evinrude	2	2¾x2½	750	99	L	M.
5	2	Aerothrust	2	3 x3½	1,300	115	2	J. S.
12	4	Airdrive	2	4 x3¾	1,500	90	H	M.
24	4	Airdrive	4	3¾x4½	900	..	L	J. S.

AMERICA'S DIESEL AND OIL MOTORS for Nineteen Nineteen

Two-Cycle Motors

Rated H.P.	Motor	No. of Cyls.	Bore & Stroke	H. P. M.	Wt.	2 or 3 Ports	Ignition
7	Gulowsen Grei.	1	5¾x7	550	1,440	3	S. I.
7	Missouri	1	5 x6	500	675	3	H. B.
7	Skandia	1	.....	600	1,100	3	H. B.
9	Skandia	1	.....	500	1,325	3	H. B.
10	Gulowsen Grei.	1	6¾x8	480	2,170	3	S. I.
13	Skandia	1	.....	425	2,640	3	H. B.
14	Missouri	2	5 x6	500	1,150	3	H. B.
15	Gulowsen Grei.	1	8¾x9½	450	4,000	3	S. I.
16	Skandia	1	.....	400	2,750	3	H. B.
17	Skandia	2	.....	550	2,700	3	H. B.
20	Skandia	1	.....	375	3,300	3	H. B.
22	Gulowsen Grei.	1	9½x11	390	5,200	3	S. I.
22	Missouri	3	5 x6	500	1,650	3	H. B.
22	Skandia	2	.....	425	3,980	3	H. B.
24	Skandia	1	.....	375	3,740	3	H. B.
30	C-O	2	8½x10	400	5,050	2	S. D.
30	Gulowsen Grei.	1	10¾x12¾	335	7,130	3	S. I.
30	Gulowsen Grei.	2	8¾x9½	450	6,700	3	S. I.
30	Missouri	4	5 x6	500	2,750	3	H. B.
30	Skandia	1	.....	375	4,200	3	H. B.
30	Skandia	2	.....	400	5,200	3	H. B.
36	Skandia	1	.....	325	5,870	3	H. B.
38	Skandia	2	.....	375	5,450	3	H. B.
45	C-O	3	8½x10	400	6,870	2	S. D.
45	Gulowsen Grei.	2	9½x11	390	10,000	3	S. I.
48	Skandia	2	.....	375	6,800	3	H. B.
50	Skandia	1	.....	300	7,900	3	H. B.
55	Skandia	2	.....	375	7,800	3	H. B.
60	C-O	4	8½x10	400	8,000	2	S. D.
60	Gulowsen Grei.	2	10¾x12¾	335	14,000	3	S. I.
60	Skandia	1	.....	300	8,800	3	H. B.
60	Wisconsin Oil	2	6 x14	400	4,500	2	D.
70	Kahlenberg	2	.....	340	8,000	..	H. B.
70	Skandia	2	.....	325	9,250	3	H. B.
75	C-O	3	10½x12½	340	14,800	2	S. D.
80	Gulowsen Grei.	2	11¾x14	310	19,000	3	S. I.
90	Wisconsin Oil	3	6 x14	400	6,000	2	D.
100	C-O	4	10½x12½	340	17,600	2	S. D.
100	Kahlenberg	3	.....	340	10,000	..	H. B.
100	Skandia	2	.....	300	14,000	3	H. B.
110	Gulowsen Grei.	2	13¾x15	290	22,000	3	S. I.
120	Skandia	2	.....	300	17,500	3	H. B.
120	Wisconsin Oil	4	6 x14	400	7,500	2	D.
130	Gulowsen Grei.	4	10¾x12¾	335	26,000	3	S. I.
130	Kahlenberg	4	.....	340	15,000	..	H. B.
140	Skandia	4	.....	325	16,000	3	H. B.
150	C-O	3	14 x18	250	29,000	2	S. D.
180	Gulowsen Grei.	4	11¾x14	310	40,000	3	S. I.
180	Skandia	2	.....	250	25,500	3	H. B.
200	C-O	4	14 x18	250	36,000	2	S. D.

Two-Cycle Motors—(Continued)

Rated H.P.	Motor	No. of Cyls.	Bore & Stroke	H. P. M.	Wt.	2 or 3 Ports	Ignition
200	Skandia	4	.....	300	20,000	3	H. B.
240	Gulowsen Grei.	4	13¾x15	280	47,000	3	S. I.
240	Skandia	4	.....	300	32,000	3	H. B.
360	Gulowsen Grei.	4	.....	..	....	..	....
360	Skandia	4	.....	250	46,000	3	H. B.
500	Skandia	6	.....	250	70,000	3	H. B.

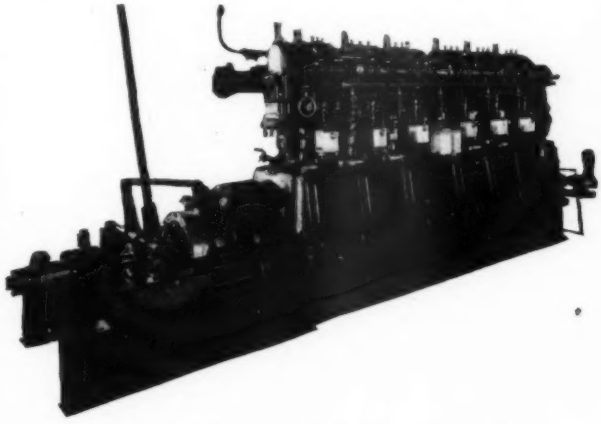
Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Strokes	R. P. M.	Wt.	Location of Valves	Ignition
12½	Burnoil	1	6¾x9	425	3,800	H	H.
25	Burnoil	1	6¾x9	425	3,800	H	H.
25	Quayle	4	4¾x6½	500	1,400	L	H.
32	Fulton	2	8 x9	400	3,500	H	D.
37½	Burnoil	3	6¾x9	425	6,200	H	H.
50	Burnoil	4	6¾x9	425	7,400	H	H.
50	Fulton	3	8 x9	400	5,000	H	D.
50	Fulton	3	8 x9	300	8,900	L	D.
60	Nlseco	4	7 x9½	450	9,200	H	D.
70	Fulton	4	8 x9	300	10,000	L	D.
70	Fulton	4	8 x9	400	6,800	H	D.
75	Burnoil	6	6¾x9	425	10,400	H	H.
100	Fulton	6	8 x9	300	15,000	L	D.
100	Fulton	6	8 x9	400	9,000	H	D.
120	Nlseco	4	9 x12½	350	16,600	H	D.
150	Craig	6	9½x12	315	16,500	..	D.
180	Nlseco	6	9 x12½	350	24,300	H	D.
200	Craig	6	9½x12	420	16,500	H	D.
200	Craig	6	9¾x15	320	21,600	..	D.
200	Winton	6	11 x14	250	44,000	H	D.
240	Nlseco	8	9 x12½	350	28,200	H	D.
240	Nlseco	4	13 x18	240	40,600	H	D.
250	Craig	6	12½x15	240	28,000	..	D.
300	McIntosh	6	.....	265	.....	H	D.
300	Winton	6	12¾x18	210	64,000	H	D.
350	Craig	8	12½x15	250	37,000	..	D.
360	Craig	6	12½x15	375	28,000	..	D.
360	Nlseco	6	13 x18	240	50,600	H	D.
400	Craig	8	12½x18	240	45,000	..	D.
450	Winton	8	12¾x18	210	86,000	H	D.
500	Craig	6	17 x24	163	88,000	..	D.
500	Craig	8	12½x15	380	37,000	..	D
500	McIntosh	6	.....	190	.....	H	D.
600	Craig	6	17 x24	195	88,000	..	D
750	McIntosh	6	.....	135	.....	H	D.
1000	McIntosh	6	.....	138	.....	H	D.
1350	McIntosh	6	.....	115	.....	H	D.

The initials used with the oil motors under the Ignition column are as follows: D, Full Diesel—S. D., Semi-Diesel—H, Hvid type—S. I., Surface Ignition—H. B., Hot Bulb. The initials under the 2 or 3 Ports and Location of Valves columns have the same meaning as with the gasoline motors.

(*Continued from page 22*)

the propeller diameter and pitch. A hull properly designed for speed, whether runabout or cruiser, can be easily propelled through the water so that a motor, turning from 800 to 1,200 r.p.m., will give the desired speed with the maximum economy. It is a case where the work done by the propeller is not so much to give the maximum thrust as to travel the maximum distance forward with a given number of revolutions with an economical slip. For such conditions the pitch ratio should be from 1.2 to 1.5.



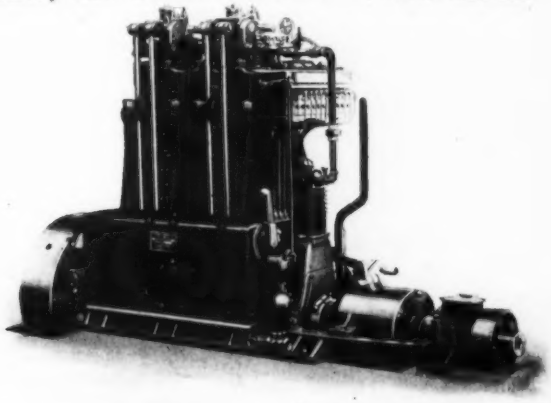
A six-cylinder two-cycle Fulton Diesel engine

Medium-speed boats such as heavy open boats or cruisers of average design present a much different set of conditions. Here the economical speed and maximum speed is much lower and the form of the underbody is generally such that the propeller must exert a much greater thrust than in the lighter, faster boats. Turning a small propeller fast will simply produce an excessive slip, so it will be seen immediately that the propeller must be larger, have a greater blade area, and consequently will require a motor which will give the maximum torque at lower speeds, say at from 400 to 800 r.p.m.

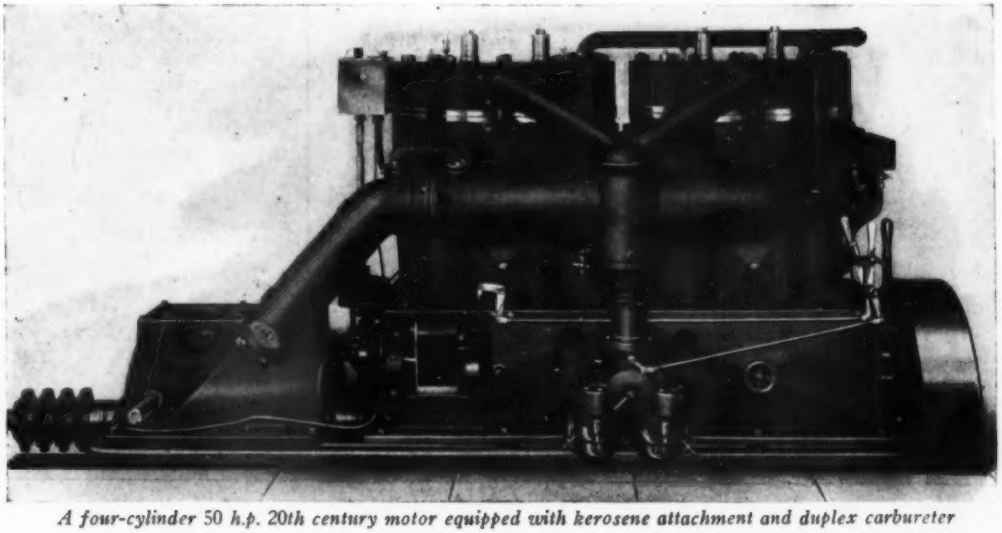
When a motor is required to produce a high torque, that is the force tending to rotate the shaft, the parts must be correspondingly stronger and consequently somewhat heavier. These are exactly the conditions for which the medium-duty motor is designed. For such a combination of hull and power plant the propeller ratio should be from 1 to 1.3, the latter ratio being a maximum and will give the best results only when used with hulls with very fine lines.

In cases where a motor boat is to be used in open waters there is another factor to be considered. When running into a head sea the boat will alternately be coasting down one wave and then immediately climbing the steep side of the next. The effect of hitting the oncoming hill of water is like running an automobile into a sandbank. Naturally the tendency of the motor is to race as the boat slides down from the crest to the trough of the sea and then slow down as it climbs to the next crest. This causes considerable strain on the engine, but a heavily-built motor, especially one with a heavy flywheel, will run much steadier and drive the boat at a much more even speed. When running before a sea there is only one way to steady the engine, that is to use a governor or the throttle and slow down the motor as the boat is swept along by the crest of the wave.

Heavily built cruisers with full lines, boats that are used for off-shore work and long continuous runs require a motor that will be first of all reliable. A breakdown would often result in the loss of the craft and possibly those aboard. Another consideration is fuel economy if long runs are to be attempted. A motor running at above its normal speed will use up a surprisingly large amount of gasoline in the course of a day.



A 25 h.p. Burnoil motor that operates on the Hvid principle

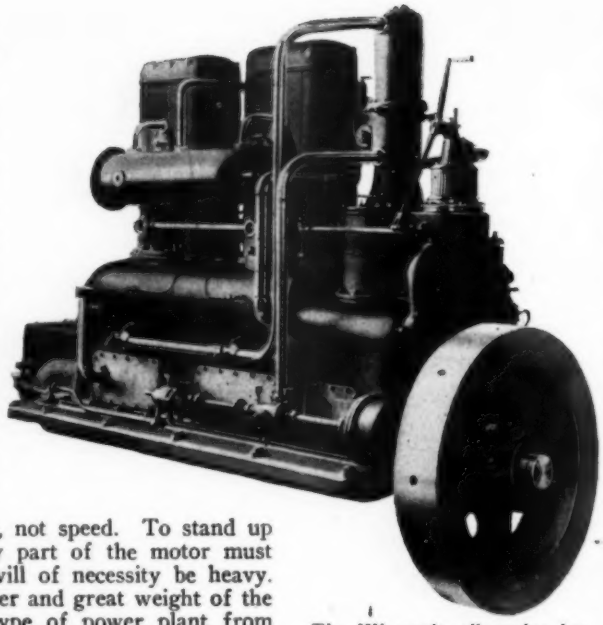


A four-cylinder 50 h.p. 20th century motor equipped with kerosene attachment and duplex carbureter

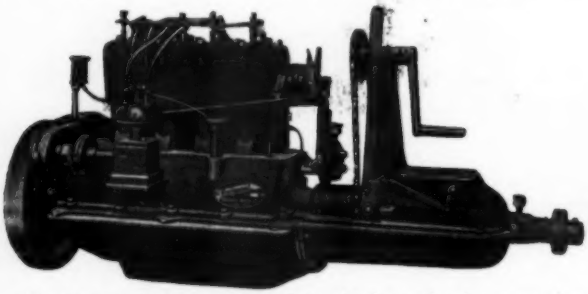
The heavier, slower turning engines, with a large factor of safety in every part are not liable to require repairs or replacements and will run hour after hour with little attention, save a supply of gasoline and lubricating oil.

Commercial boats, whether used for towing or cargo carrying, require a maximum thrust from the propeller with the result that the blade area is large and the speed slow, the pitch ratio being not much over 1 or 1.2. To turn such a propeller requires a maximum torque at a minimum speed. In other words the engines must deliver the power in the form of force, not speed. To stand up under such conditions every part of the motor must be carefully designed and will of necessity be heavy. The large size of the propeller and great weight of the motor generally bars this type of power plant from pleasure boats from an economy standpoint.

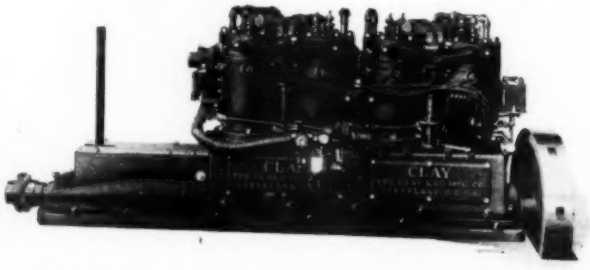
Once the type of power plant is decided upon the next question is how much power will be required for a given speed. This is the hardest question to answer, and one that can hardly be arrived at by mathematical calculations. The best guide is the performance of other boats of similar size and lines. Then comes the question of fuel. The high price of gasoline has forced the development of engines to operate on cheaper fuels.



The Wisconsin oil engine has two pistons in each cylinder which travel in opposite directions but are connected to the same crankshaft



The Universal is a compact, 12 h.p. high-speed unit power plant



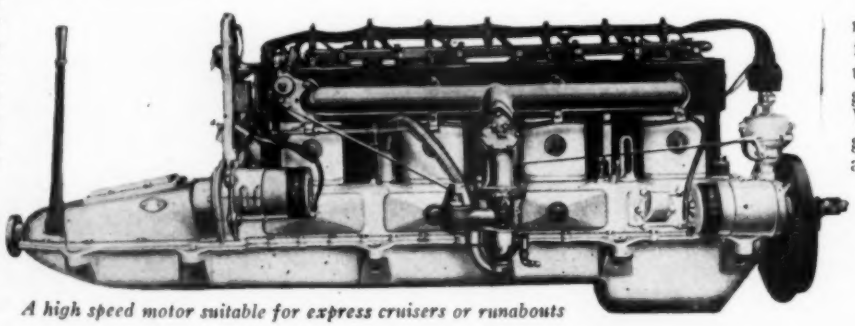
The Clay motor is typical of engines for commercial boats

If the engine is of the high-speed type there is only one fuel: Gasoline. Medium-duty motors can be had that will operate equally well either on gasoline, kerosene, or distillate. It is generally necessary to start and run on gasoline until the engine has become warmed up, when the change to the cheaper fuel can be made. It is not to be understood that any medium-duty motor can be run on kerosene by simply changing the fuel supply. Some means must be furnished to thoroughly vaporize the kerosene and form a thorough mixture with the air before the charge enters the cylinder.

Although there are devices which are intended to adapt any motor to the use of kerosene by making use of heat from the exhaust line for vaporizing the kerosene and forming a readily combustible mixture it is generally necessary to reduce the compression or preignition will take place. This undesirable result is aggravated by the high initial temperature at which the mixture enters the cylinder but can be overcome by increasing the clearance by means of fillers, extra gaskets or other similar methods of raising the cylinder head.

For commercial boats the more satisfactory solution of the fuel problem where the cost of gasoline is a consideration would be the use of one of the several types of heavy-oil motors. Up to the present time the Diesel type engines have been built only in comparatively large units but where less power is wanted the surface ignition, hot bulb, and Hvid type motors operate economically on the cheaper grades of heavy oils.

From what has been accomplished in the last two years it is very probable that the coming season will see the introduction of Diesel engines in small units. There are, in fact, at the present time several manufacturers who are prepared to supply these motors in as small as 30 h.p. units.



A high speed motor suitable for express cruisers or runabouts

Another alternative source of fuel is in the use of producer gas plants. Where suitable grades of coal are cheap this apparatus used in connection with a suitable motor will prove a most economical power.

AMERICA'S FOUR-CYCLE MOTORS for Nineteen Nineteen

Four-Cycle Motors Under 8 Horsepower

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
1½	Nieland	1	3 x3½	750	...	L	O.
2	Nieland	1	3½x4	700	...	L	O.
2	Regal	1	3¼x3½	800	125	L	J. S.
2½	Nieland	1	4 x4½	500	275	L	M. B.
3	Automatic	1	4½x5	500	300	L	O.
3	Standard Kid	1	3¾x4½	...	...	H	J. S.
3¼	Evansville	1	4½x5	500	300	H	M.
4	Anderson	1	4½x5	550	400	T	J. S.
4	Buffalo	2	3 x4	700	240	L	J. S.
4	Clay	1	4½x5	500	385	H	J. S.
4	Frisco Standard	1	4¾x6	390	615	H	O.
4	Guarantee	1	4½x4½	...	...	..	J. S.
4	Lisk	1	4½x5	400	250	L	J. S.
4	Miller	1	4½x5	600	400	L	M.
4	Missouri	1	4¾x5	...	...	L	D.
4	Nieland	1	5 x6	400	525	L	M. B.
4	Nieland	2	3½x4	700	400	L	J. S.
4	N. & T.	2	3½x4	550	400	L	M. B. M.
4	Regal	1	4 x4½	800	290	L	J. S.
4	Vulcan	1	4½x6	500	450	T	J. S.
5	Evansville	1	5 x6	500	400	H	M.
5	Frisbie	1	4¾x5	550	325	H	O.
5	Frisco Standard	1	5¾x6½	400	850	H	O.
5	Palmer	1	4½x6	600	375	T	D. & M.
5	Regal	1	4½x5½	600	380	L	J. S.
5	Union	1	5¾x6½	400	640	..	O.
5	Vulcan	1	5¼x7	500	650	T	J. S.
5	Wolverine	1	5½x6	500	494	L	J. S.
6	Anderson	1	5 x6½	500	600	T	J. S.
6	Automatic	2	4¼x5	500	525	L	O.
6	Automatic	1	5½x7	400	643	L	O.
6	Buffalo	2	3½x5	600	400	L	J. S.
6	Clay	1	5½x7	375	675	H	J. S.
6	Fisherman	1	5 x6	550	650	H	J. S.
6	Hettinger	1	5½x6	400	400	L	M. B.
6	Miller	1	5¾x6	500	500	L	M.
6	M. & T.	2	5 x6	550	600	L	M. B. M.
6	Nieland	1	6 x7½	350	750	L	M. B.
6	Nieland	2	4 x5	550	525	L	M. B.
6	Peerless	1	5 x6	500	450	L	J. S.
6	Palmer	1	5 x6	600	400	T	D. & M.
6	Standard Kid	2	3¾x4½	...	...	H	J. S.
6½	Palmer	1	5½x6	600	425	T	M.
7	Chesapeake	1	6 x7	500	350	L	M.
7	Doman	1	5 x6	600	500	T	B. or M.
7	Frisbie	1	6 x6	450	500	H	O.
7	Frisco Standard	1	6¾x7	380	1,130	H	O.
7	Guarantee	1	6 x5	...	...	..	J. S.
7	Regal	1	5¾x6	550	760	L	O.
7½	Evansville	2	4½x5	500	400	H	M.
7½	Vulcan	1	6½x7¼	450	850	T	J. S.

8 to 18 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
8	Anderson	2	4½x5	550	550	T	J. S.
8	Acme	1	6¼x7½	360	1,470	H	O.
8	Carl	2	4½x5	450	350	L	D.
8	Clay	2	4½x5	500	575	H	J. S.
8	Clay	1	6½x7	375	825	H	J. S.
8	Evansville	1	6 x6¼	500	625	H	M.
8	Frisco Standard	2	4¾x6	440	1,000	H	O.
8	Guarantee	1	6 x7	...	...	..	J. S.
8	Guarantee	2	4½x4½	...	...	..	J. S.
8	Missouri	2	4¾x5	...	...	L	D.
8	Nieland	1	6½x8	325	900	L	M. B.
8	Nieland	2	5 x6	400	800	L	M. B.
8	Niagara	2	3½x4½	800	415	T	D. & M.
8	Regal	2	4 x4½	800	520	L	J. S.
8	Roberts	2	3¾x4	1,000	190	..	J. S.
8	Union	2	5¾x6	500	1,150	..	O.
8	Vulcan	2	4½x6	550	700	T	J. S.
9	Automatic	3	4¼x5	500	700	L	O.
9	Hettinger	2	4½x6	450	800	L	J. S.
9	Regal	1	6½x7	500	1,230	L	O.
10	Acme	1	7¼x9	340	1,850	H	O.
10	Clay	1	7½x7	375	950	H	J. S.
10	Evansville	2	5 x6	500	550	H	M.
10	Frisbie	2	4¾x5	550	430	H	O.
10	Frisco Standard	2	5½x6	400	1,320	H	O.
10	Guarantee	1	7 x7	...	...	..	J. S.
10	Harris	2	5 x5½	600	550	S	D.
10	Hunter	4	2¾x4	800	260	L	M
10	Miller	2	4½x6	600	600	L	M.
10	Niagara	2	4½x5½	800	525	T	D. & M.
10	Regal	2	4½x5½	600	725	L	J. S.
10	Ralaco	2	4 x6	600	860	H	J. S.
10	Reliable	2	5 x5	600	1,500	H	J. S.
10	Sterling	4	2¾x4½	1,000	250	L	M.
10	Vulcan	2	5¼x7	500	950	T	J. S.
11	Evansville	1	7 x9	350	1,050	H	M.
11	M. & T.	2	5 x6	500	700	L	M. B. M.
11	Palmer	2	4½x6	600	650	T	D. & M.
11	Vulcan	1	7½x8½	400	1,100	T	J. S.
12	Anderson	2	5 x6	500	1,000	T	M. & B.
12	Automatic	2	5½x7	400	643	L	O.
12	Buffalo	2	5 x6½	400	1,170	L	J. S.
12	Clay	2	5½x7	400	1,300	H	J. S.
12	Doman	2	4¾x6	600	650	T	B. or M.
12	Frisco Standard	2	6 x7	380	1,690	H	O.
12	Fisherman	2	5 x6	550	850	H	J. S.
12	Gray	2	3¾x4½	900	385	L	J. S.

8 to 18 Horsepower—(Continued)

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
12	Hunter	4	3¼x4½	800	280	L	M.
12	Hettinger	2	5½x6	450	600	L	O.
12	Kermath	4	3½x4	1,200	470	L	M.
12	Lathrop	2	5¼x6½	450	...	T	J. S.
12	Lisk	2	4½x5	400	500	L	J. S.
12	M. & T.	4	4½x5	550	900	L	M. B. M
12	Missouri	2	5 x6	...	...	L	M. or D.
12	Nieland	2	6 x7	375	1,200	L	M. B.
12	Peerless	2	5 x6	500	600	L	J. S.
12	Palmer	2	5 x6	600	750	T	M. & D.
12	Standard	2	5 x6½	450	850	L	M. B.
12	Universal	4	2¾x4	1,200	300	L	D.
12	Union	2	6 x7	400	1,290	..	O.
12	Wolverine	2	5½x7	500	950	L	J. S.
13	Carl	2	5 x6	450	600	L	D.
14	Aristocrat	4	3¼x4	950	664	T	M.
14	Chesapeake	2	6 x7	500	700	L	M.
14	Guarantee	2	6 x5	...	...	..	J. S.
14	Guarantee	4	3¾x4	...	...	..	J. S.
14	L-A.	4	3¾x4½	900	...	L	M.
14	Miller	2	5¼x6½	500	800	L	M.
14	M. & T.	2	5½x7	425	1,200	L	M. B. M
14	Niagara	4	4¾x5½	900	625	T	D. & M.
14	Regal	2	5¼x6½	550	985	L	O.
14	Wolverine	2	6½x7	400	1,279	L	J. S.
15	Buffalo	2	6 x7½	350	1,400	L	J. S.
15	Evansville	3	5 x6	500	725	H	M.
15	Evansville	4	4½x5	500	635	H	M.
15	Carl	2	6 x8	350	650	L	D.
15	Harris	2	5½x6½	900	800	L	D.
15	Niagara	4	3½x4½	300	560	T	D. & M
15	Palmer	3	4½x6	600	900	T	D. & M.
15	Ralaco	2	5 x7	500	1,300	H	J. S.
15	Sterling	2	5½x7	500	1,065	L	M.
15	Vulcan	2	6½x7¼	475	1,350	T	J. S.
16	Acme	2	6¼x7½	360	2,250	H	O.
16	Carl	4	4½x5	600	550	L	D.
16	Clay	2	6½x7	400	1,525	H	J. S.
16	Evansville	2	6 x6¼	500	900	H	M.
16	Frisbie	2	6 x6	475	700	H	O.
16	Frisco Standard	2	6¼x7½	360	1,785	H	O.
16	Guarantee	2	6 x7	...	...	..	J. S.
16	Kermath	4	4¾x4	1,200	500	L	M.
16	Lathrop	2	5½x6½	450	...	L	J. S.
16	Mianus	2	6 x8	400	1,600	T	O.
16	Nieland	2	6½x8	325	1,400	L	M. B.
16	Reliable	2	6 x6	550	2,010	H	J. S.
16	Union	2	6½x8	400	1,750	..	O.
16	Vulcan	4	4½x6	550	1,000	T	J. S.
16	Wood & Chute	2	6 x7	400	1,300	L	J. S.
17	F. & B.	4	3¾x4½	1,400	450	L	D.
18	Automatic	3	5½x7	400	1,425	L	O.
18	Frisbie	3	4¾x5	650	650	H	O.
18	Gaeth	2	5½x8	600	1,450	..	M.
18	Hettinger	2	6½x8	400	1,500	L	O.
18	Lisk	3	4½x5	500	650	L	J. S.
18	M. & T.	2	6½x8	425	1,600	L	M. B. M
18	Missouri	4	4¾x5	...	...	L	M. or D.
18	Nieland	3	6 x7	375	1,600	T	M. B.
18	Palmer	3	5 x6	600	1,000	T	D. & M.
18	Palmer	2	6¾x8	400	1,600	T	D. & M.
18	Regal	2	6½x7	500	1,625	L	O.
18	Standard	2	6 x8	400	1,200	L	M. B.
18	Wright	2	6 x7½	550	1,850	H	M. B.
18	Wisc. Cons.	4	3¾x5	1,000	490	L	M.

20 to 30 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
20	Acme	2	7¼x9	340	2,925	H	O.
20	Buffalo	4	3¾x5	800	710	L	J. S.
20	Brennan	4	4 x5	1,000	600	L	M.
20	Clay	2	7½x7	400	1,750	H	J. S.
20	Evansville	4	5 x6	500	900	H	M.
20	Frisco Standard	2	7¼x9	320	4,635	H	O.
20	Guarantee	2	7 x7	...	...	..	J. S.
20	Harris	2	5 x7	500	1,000	L	D.
20	Kermath	4	4 x4	1,200	550	L	M.
20	Miller	4	3½x5	900	650	L	M.
20	Mortan	4	3½x4	1,000	470	H	M.
20	Motorgo	4	3¾x4½	1,500	550	..	M.
20	Nieland	2	7½x9	300	2,000	L	M. B.
20	N. & S.	2	7 x9	350	2,500	L	M. B.
20	Peerless	4	4 x6	600	750	L	M.
20	Palmer	4	4½x6	600	1,150	T	D. & M.
20	Ralaco	4	4 x6	600	1,375	H	J. S.
20	Red Wing	4	3½x4½	700	670	L	M.
20	Regal	4	4½x5½	600	985	L	J. S.
20	Scripps	4	3½x4	1,200	475	H	M.
20	20th Century	2	6½x8½	400	2,000	L	M.
20	Union	2	7½x9	380	2,400	..	O.
20	Vulcan	4	5¼x7	500	1,300	T	J. S.
20	Wolverine	2	5½x7	800	950	L	J. S.
21	Lathrop	3	5¼x6½	500	...	T	J. S.
22	Buffalo	2	7 x9	350	2,100	L	J. S.
22	Evansville	2	7 x9	350	1,800	H	M.
22	F. & B.	4	3½x5	1,200	525	T	M.
22	Miller	4	4½x6	800	1,200	L	M.
22	Vulcan	2	7½x8½	425	2,100	T	J. S.
22	Wolverine	3	6½x7	400	1,980	L	J. S.
22	Wisc. Cons.	4	3¾x5	1,000	523	L	M.
24	Anderson	4	5 x6	500	1,600	T	M. B.

America's Four-Cycle Motors for Nineteen Nineteen—(Continued)

20 to 30 Horsepower—(Continued)

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	H. P. M.	Wt.	Location of Valves	Ignition
24	Automatic	4	5½x7	400	1,800	L	O.
24	Bridgeport	3	6½x7	400	1,800	L	J. S.
24	Buffalo	4	5 x6½	400	1,960	L	J. S.
24	Evansville	3	6 x6¼	500	1,275	H	M.
24	Gray	4	3¾x4½	900	600	L	J. S.
24	Missouri	4	5 x6	....	....	L	M. or D.
24	Mianus	3	6 x8	400	2,200	T	O.
24	M. & T.	4	5 x6	650	1,000	L	M. B. M.
24	Nieland	3	6½x7½	325	2,000	T	M. B.
24	Peerless	2	5¾x7	500	1,200	T	M.
24	Palmer	4	5 x6	600	1,250	T	D. & M.
24	Red Wing	4	3¾x4¼	700	680	L	M.
24	Standard	4	5 x6½	450	1,600	L	M. B.
24	Wisc. Cons.	4	4 x5	1,000	556	L	M.
24	Wood & Chute	3	6 x7	400	1,700	L	J. S.
25	Automatic	2	7½x9	350	2,625	L	O.
25	Acme	3	6¼x7½	375	2,550	H	O.
25	Clay	4	5½x7	450	2,300	H	M.
25	Capitol	4	3¾x5½	1,000	575	L	M.
25	Frisco Standard	3	6½x7	450	2,310	H	O.
25	Frisbie	3	6 x6	600	1,050	H	O.
25	Guarantee	4	4½x5½	....	....	..	J. S.
25	Hettinger	2	7½x9	400	2,200	L	O.
25	Knox	2	7 x8	550	1,900	T	J. S.
25	Niagara	4	4½x5½	900	900	T	D. & M.
25	Palmer	2	7½x10	400	3,000	T	D. & M.
25	Reliable	2	7 x7	450	3,000	H	J. S.
25	Ralaco	2	7 x9	425	3,300	H	M. B.
25	Standard	4	4 x5½	900	500	L	M. B.
25	Sterling	4	3¾x5½	1,000	600	L	M.
25	Vulcan	3	6½x7¼	475	1,800	T	J. S.
26	Lisk	4	4½x5	500	750	L	J. S.
26	Palmer	3	6¾x8	400	2,000	T	D. & M.
27	Acme	2	8¼x10	320	3,975	H	O.
27	Gaeth	3	5½x8	600	1,800	..	M.
27	Standard	3	6 x8	400	1,800	L	M. B.
28	Carl	4	5 x6	500	500	L	D.
28	F. & B.	4	4 x5¼	1,000	800	T	M.
28	Lathrop	4	5¼x6½	500	....	T	J. S.
28	M. & T.	3	6½x8	400	1,900	L	M. B. M.
28	Speedway	4	4 x4½	1,200	560	L	J. S.
30	Automatic	4	5 x7	550	1,800	L	J. S.
30	Buffalo	4	4¾x5	800	929	L	J. S.
30	Buffalo	4	6 x7½	350	4,850	L	J. S.
30	Enterprise	3	6¾x8¼	....	3,120	H	.....
30	Frisbie	4	4¾x5	800	725	H	O.
30	Frisco Standard	2	8¾x10½	300	4,190	H	O.
30	Frisco Standard	3	6½x8	360	3,285	H	O.
30	Lathrop	3	5½x6½	700	....	T	J. S.
30	M. & T.	4	5½x7	425	2,200	L	M. B. M.
30	Miller	4	5¼x6	700	1,500	L	M.
30	N. & S.	2	8 x10	300	3,000	L	M. B.
30	Ralaco	4	5 x7	500	2,200	H	J. S.
30	Regal	4	5¼x6½	600	1,550	L	J. S.
30	Union	2	8¾x11	300	4,265	..	O.
30	Vulcan	4	6½x7¼	475	2,100	T	J. S.
30	Wisc. Cons.	4	4½x5	1,000	612	T	M.
30	Wright	3	6 x7½	550	2,250	H	M. B.

32 to 50 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
32	Capitol	4	4¼x5½	1,000	600	L	M.
32	Carl	4	6 x8	500	800	L	D.
32	Evansville	4	6 x6¼	500	1,425	H	M.
32	Mianus	4	6 x8	400	2,750	T	O.
32	Regal	4	4½x5½	1,000	800	L	J. S.
32	Wolverine	3	7½x9	350	3,490	L	J. S.
32	Wood & Chute	4	6 x7	400	2,300	L	J. S.
35	Acme	3	7¼x9	350	4,075	H	O.
35	Acme	4	6¼x7½	400	3,475	H	O.
35	Brennan	4	4½x5	1,000	700	L	M.
35	Clay	4	6½x7	450	2,600	H	M.
35	Enterprise	3	7½x9½	....	4,215	H	.....
35	F. & B.	4	4½x5½	1,000	2,885	T	M.
35	Guarantee	4	5 x5½	....	....	..	J. S.
35	Miller	4	5¼x7½	550	1,900	L	M.
35	Palmer	4	6¾x8	400	2,400	T	D. & M.
35	Palmer	3	7½x10	400	3,500	T	D. & M.
35	Peerless	4	5 x6	600	850	L	M.
35	Scripps	4	4¼x6	900	1,000	L	M.
35	Union	3	7½x9	360	4,825	..	O.
35	Vulcan	3	7½x8½	425	2,850	T	J. S.
36	Bridgeport	3	7½x9	375	3,200	L	J. S.
36	Gray-Prior	4	4½x8	600	1,800	L	J. S.
36	Gaeth	4	5½x8	600	2,100	..	M.
36	Hettinger	4	6½x8	400	3,200	L	O.
36	Missouri	6	5 x6	....	....	L	M. or D.
36	Regal	4	6½x7	500	2,700	L	J. S.
36	Red Wing	4	4½x5	1,000	610	L	M.
37	Automatic	3	7½x9	350	3,465	L	O.
37	Standard	4	6 x8	400	2,800	L	M. B.
40	Automatic	4	5½x7	550	1,850	L	J. S.
40	Brennan	4	4½x5	1,000	700	L	M.
40	Brennan	4	5 x5	1,000	850	L	M.
40	Doman	4	4¾x6	1,000	1,000	T	M.
40	Enterprise	3	8 x10¼	....	4,870	H	.....
40	Frisbie	4	6 x6	600	1,200	H	O.
40	Frisco Standard	3	8 x10	320	4,875	H	O.
40	Imperial (Canada)	4	6½x8	450	2,600	L	J. S.
40	Knox-M. Co.	4	5 x5½	1,000	900	H	M. & D.
40	Lathrop	4	5½x6½	700	....	T	J. S.
40	Lisk	6	4¾x5	500	850	L	J. S.
40	Lisk	4	6 x7	400	1,200	T	J. S.
40	Missouri	4	7 x8	....	....	L	M or D.
40	M. & T.	4	6½x8	400	2,500	L	M. B M.
40	N. & S.	3	8 x9	325	4,000	L	M. B.
40	Red Wing	4	4½x6	1,000	650	L	M.
40	Union	3	8 x10	330	6,290	..	O.
40	Vulcan	6	5¾x7	550	1,900	T	J. S.
40	Wolverine	4	5½x7	800	1,600	L	J. S.

32 to 50 Horsepower—(Continued)

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
40	Wisc. Cons.	4	4¾x5½	1,000	787	T	M.
40	Wright	4	6 x7½	550	3,000	H	M. B.
42	Wisc. Cons.	6	4¼x5	1,000	826	T	M.
42	Wolverine	3	8½x9	350	3,660	L	J. S.
44	Evansville	4	7 x9	350	2,950	H	M.
44	Speedway	4	4½x5½	1,200	950	L	J. S.
45	Acme	3	8¼x10	325	5,050	H	O.
45	Automatic	6	5 x7	550	2,500	L	J. S.
45	Buffalo	4	7 x9	350	3,655	L	J. S.
45	F. & B.	4	5 x6¼	1,000	1,095	T	M.
45	Harris	4	5½x6½	700	1,400	L	D.
45	Niagara	4	4¾x5½	900	945	T	D. & M.
45	Ralaco	6	5 x7	500	2,700	H	J. S.
45	Reliable	2	9¼x10	350	6,000	H	J. S.
45	Scripps	6	4¼x6	800	1,325	L	M.
45	Union	3	8¾x10½	330	6,450	..	O.
45	Vulcan	4	7½x8½	425	3,400	T	J. S.
45	Wright	3	7½x9	475	4,000	H	M. B.
46	Wisc. Cons.	4	5⅛x5½	1,000	795	T	M.
50	Anderson	4	7 x8½	450	2,900	T	M. & B.
50	Automatic	4	7½x9	350	4,430	L	O.
50	Automatic	4	6½x8	500	3,000	L	J. S.
50	Acme	4	7¼x9	375	5,160	H	O.
50	Brennan	6	4½x5	1,000	800	L	M.
50	Bridgeport	4	7½x9	376	4,000	L	J. S.
50	Clay	4	7½x7	450	3,000	H	M.
50	Clay	2	8½x10	350	4,000	H	M.
50	Capitol	4	3¾x5½	2,000	575	L	M.
50	F. & B.	6	4½x5½	1,000	1,275	T	M.
50	Frisbie	6	4¾x5	850	985	H	O.
50	Frisco Standard	3	8¾x10½	300	6,480	H	O.
50	Hettinger	4	7½x9	350	4,500	L	O.
50	Knox	4	7 x8	550	3,200	T	J. S.
50	Miller	4	6 x9	450	2,700	L	M.
50	Peerless	4	5¾x7	500	1,700	T	M.
50	Palmer	4	7½x10	400	4,200	T	D. & M.
50	Ralaco	4	7 x9	425	4,800	H	M. B.
50	Regal	4	7½x9	450	4,600	L	J. S.
50	Scripps	4	4¼x6	1,500	825	L	M.
50	20th Century	4	6½x8½	450	3,400	L	M. & B.
50	Union	3	8¾x10½	325	7,000	..	O.
50	Winton	4	6½x9	550	4,200	L	M.

54 to 145 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R. P. M.	Wt.	Location of Valves	Ignition
54	Gaeth	6	5½x8	600	3,000	..	M.
54	Standard	6	6 x8	400	3,200	L	M. B.
54	Wisc. Cons.	4	5½x7	800	1,290	T	M.
55	Acme	3	8¾x10½	300	6,680	H	O.
55	Doman	4	7 x9	500	2,950	T	M.
55	Enterprise	3	9 x10½	....	6,590	H	.....
55	Sterling	4	5½x6¾	800	1,850	T	M. & D
55	Wisc. Cons.	6	4¾x5½	1,000	1,185	T	M.
56	Vulcan	3	8¾x10½	400	4,200	T	J. S.
57	Wisc. Cons.	4	5½x7	800	1,290	T	M.
60	Automatic	6	5½x7	550	2,750	L	J. S.
60	Acme	6	6¼x7½	450	4,828	H	O.
60	Buffalo	4	5½x7	900	1,730	L	J. S.
60	Brennan	4	5½x6	1,000	975	L	M.
60	Enterprise	3	9 x11	....	7,040	H	.....
60	Harris	4	6 x7	600	1,600	L	D.
60	Lisk	6	6 x7	400	1,500	T	J. S.
60	Missouri	6	7 x8	....	....	L	M or D.
60	M. & T.	4	7½x10	375	4,000	L	M. B. M.
60	Niagara	4	5½x6¼	900	1,525	T	D. & M.
60	Palmer	6	6¾x8	400	3,800	T	D. & M.
60	Standard	6	6 x6½	700	1,500	L	M. B.
60	Union	3	9 x11	320	7,400	..	O.
60	Wolverine	3	9½x12	300	6,327	L	J. S.
62	Wisc. Cons.	4	5¾x7	800	1,290	T	M.
62	Wright	4	7½x9	475	5,000	H	M. B.
65	Acme	4	8¼x10	350	6,675	H	O.
65	Capitol	4	4¼x5½	2,000	575	L	M.
65	Eleu	4	5¼x6	1,000	650	T	M.
65	Harris	6	5½x6½	700	2,000	L	D.
65	Wright	6	6 x7½	550	4,250	H	M. B.
65	Wisc. Cons.	6	5⅛x5½	1,000	1,225	T	M.
66	Speedway	6	4½x5½	1,200	1,200	L	J. S.
70	Automatic	4	7½x9	500	4,800	L	J. S.
70	Buffalo	6	7 x9	350	4,850	L	J. S.
70	Vulcan	6	7½x8½	425	4,500	T	J. S.
75	Automatic	6	7½x9	350	6,500	L	O.
75	Automatic	3	10 x14	275	8,000	L	O.
75	Automatic	6	6½x8	500	4,250	L	J. S.
75	Frisbie	6	6 x6	750	1,600	H	O.
75	F. & B.	6	5 x6¼	1,100	1,480	T	M.
75	Gaeth	6	5½x8	800	3,000	..	M.
75	Harris	6	6 x7	600	3,200	L	D.
75	Knox	6	7 x8	550	4,500	T	J. S.
75	Standard	4	8 x10	400	5,300	L	M. B.
75	Speedway	4	5¾x7	1,000	1,859	L	J. S.
75	Scripps	6	4¼x6	1,500	1,100	L	M.
75	Vulcan	4	8¾x10½	375	5,500	T	J. S.
80	Acme	6	7½x9	425	6,950	H	O.
80	Buffalo	4	6¾x9	800	2,600	L	J. S.
80	Brennan	4	6 x6	1,000	1,050	L	M.
80	Enterprise	3	10 x12½	....	9,180	H	.....
80	Frisco Standard	3	9¾x12	280	9,105	H	O.
80	M. & T.	4	8½x11	350	5,000	H	M. B. M.
80	Niagara	4	6¾x7	900	1,650	T	D. & M.
80	Palmer	6	7½x10	400	5,600	T	D. & M.
80	Ralaco	6	7 x9	425	6,600	H	O.
75	20th Century	6	6½x8½	475	4,500	L	M. & B.
80	Union	3	10 x12	310	9,500	..	O.
80	Wisc. Cons.	6	5¼x7	800	1,545	T	M.
80	Wolverine	3	11 x12	300	6,747	L	J. S.
80	Winton	6	6½x9	600	5,400	L	M.
85	Acme	4	8¾x10½	325	8,200	H	O.
85	Doman	6	7 x9	500	4,500	T	M.

(Continued on page 82)

A Florida Express Cruiser, Betty M III

Betty M III is first of all a real, comfortable, cruiser well able to go anywhere

The two six-cylinder Van Berck motors give her a cruising speed of 25 m.p.h.

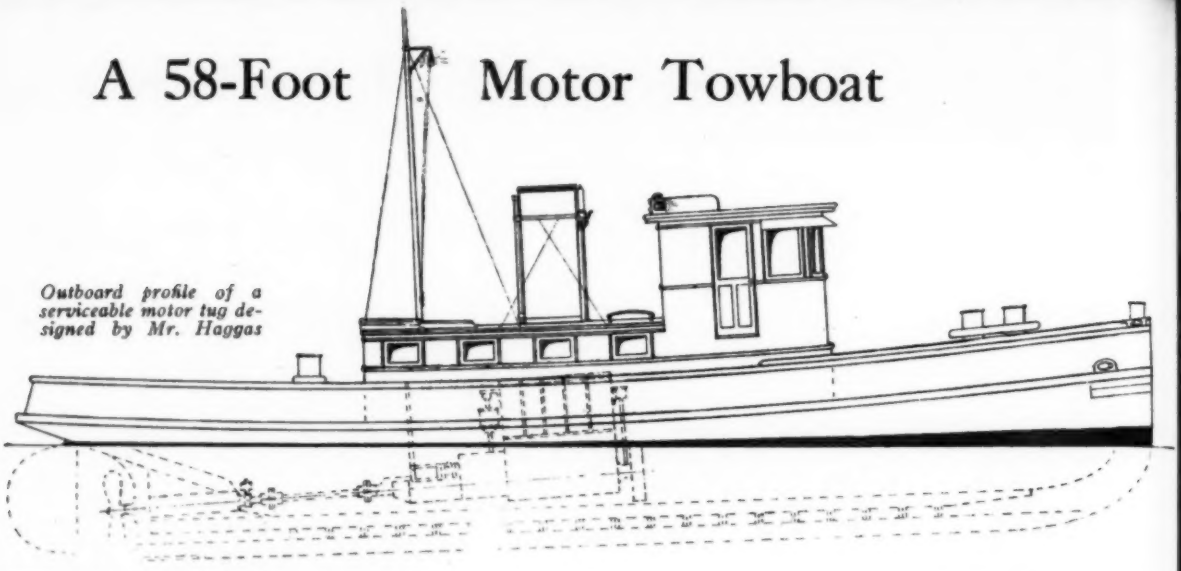
ONE of the most complete and comfortable express cruisers is Betty M III owned by Commodore Charles W. Kotcher, one of Detroit's best known yachtsmen. As the name indicates, this is the third of the series of express cruisers that have carried the commodore's flag. This cruiser, like the first, is a 48-footer, and is as a matter of fact, merely an improvement on its predecessor. Betty M II was a 60-footer and is now in the Sectional Patrol. Betty M III is kept at Miami, Fla., where the Commodore spends the winter months. The most unique feature of this cruiser is the glass enclosure for the bridge deck. This is so constructed that the sash may be dropped into pockets, leaving the deck as free and open as one could wish. With the deck enclosed it makes a most comfortable dining saloon or lounging room in chilly or rainy weather.

Driven by two six-cylinder Van Blerck motors, Betty M III can easily maintain a cruising speed of 25 m.p.h. under all ordinary conditions. Although she is only a 48-footer there are sleeping accommodations for eight persons and a crew of two.

The enclosed bridge deck of Betty M III makes a most comfortable dining saloon or lounging deck

Looking forward from the bridge deck through the cabin to the galley showing the luxurious equipment

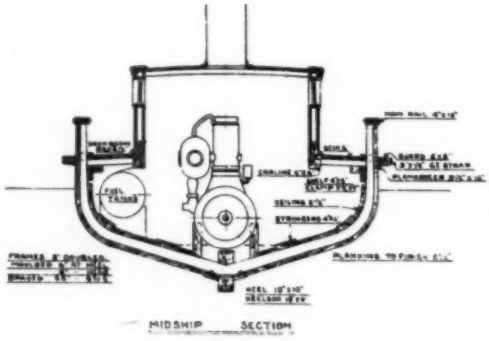
A 58-Foot Motor Towboat



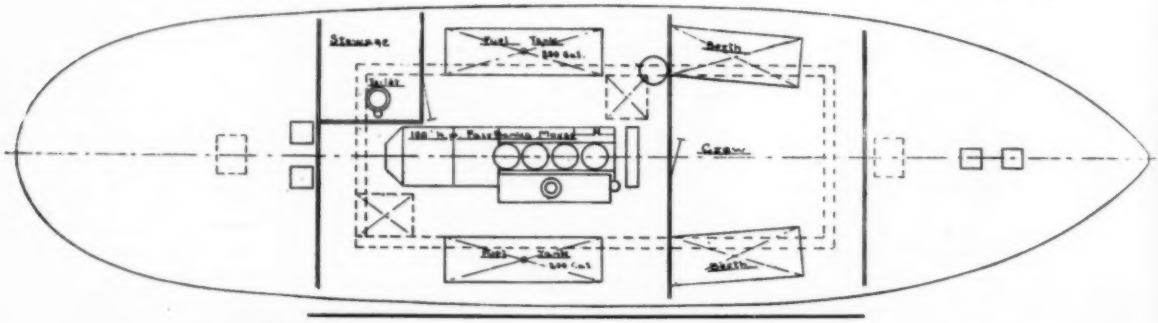
Outboard profile of a serviceable motor tug designed by Mr. Haggas

E. LOCKWOOD HAGGAS, of Philadelphia, Pa., is the designer of the serviceable motor towboat shown in the accompanying illustration. She is constructed of wood and built of heavy material throughout to withstand the rough handling of canal and river service. She measures 58 feet in overall length, has a beam of 15 feet 6 inches, and a draft of 6 feet.

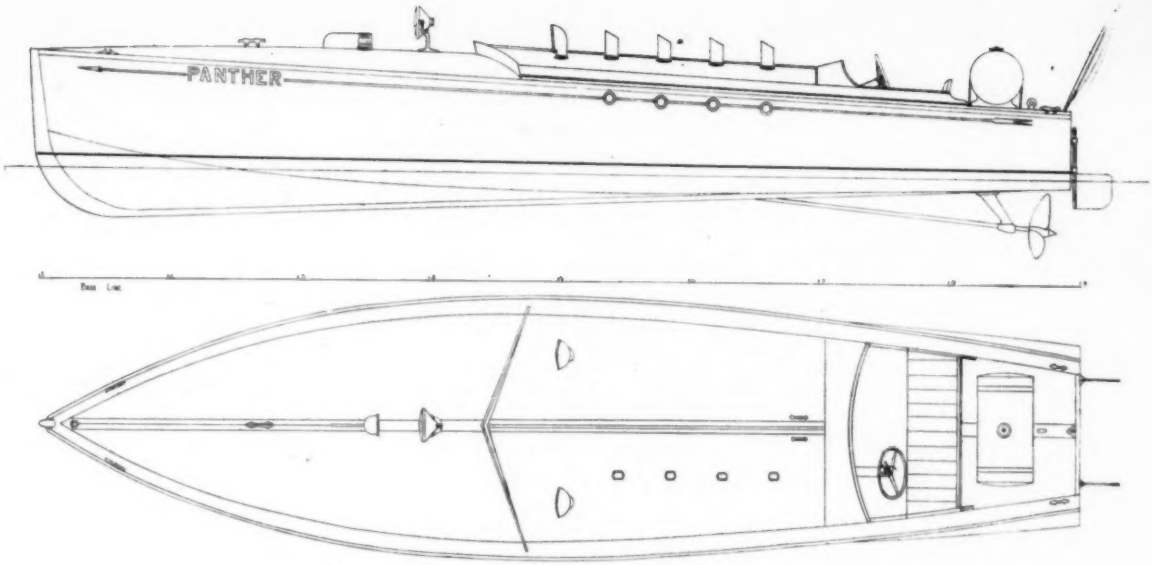
As the plans of the boat show, ample deck space is provided to facilitate the handling of a tow and



the pilot house is raised above the main deck to assure a clear view for the helmsman when towing alongside. Ample sleeping quarters are provided forward for two men, although the boat is intended for day service only. All of the compartments are made large and excellent ventilation is obtained from the stack and the numerous windows.



Sentinel, a 45-foot by 11-foot U. S. Coast Guard Cutter recently completed by the Richardson Boat Co., of North Tonawanda, N. Y. Sentinel is powered with a six-cylinder 40-60 h.p. Sterling motor and shows a speed of 10¼ m.p.h.



My Ideal Runabout

No. 10—Panther, a 20-Foot Hydroplane

By F. H. Miller

IT has been said that every man should have a hobby. Some men have several, but personally I have never had but one—boating. Mine was born some years ago while spending a summer at Buckeye Lake—one of Ohio's most beautiful inland waters—an artificial lake, constructed by the State before its system of canals had outlived their usefulness and used originally as a canal feeder.

It is said to be the largest artificial lake in the United States, being eight miles long and averaging fully a mile wide. The water is in many places as much as forty feet deep, and on the whole is a most delightful spot to spend a summer—hence it is much frequented by those aquatically inclined. Naturally motor boating and sailing are the popular sports here, both of which have for years been fostered by the Buckeye Lake Yacht Club—a club, by the way, of more than local prominence.

What could be more inspiring to a lad of fourteen than the sight of a dozen or more fast little motor boats viewed from the broad porch of the Yacht Club—all striving on racing days to be first over the line or the more prosaic but none the less graceful catboat as she heeled to the wind on the turns in her effort to get around first. What more natural than that my young ambition should be fired with a determination to own a boat of my own that I might cease to become a day land sailor and take my place among the elect on the water?

It was just at this time that a sympathetic friend who owned a rather up-to-date catboat which had been laid up for the last two years, proposed to me that if I would go to work and put the boat into commission I might have the use of it throughout the summer or until he had the opportunity to dispose of it. Eagerly I jumped at the proposal and the next day started in on the task.

For two long weeks I labored at the job—scraping, sandpapering, painting and overhauling it generally, but it was finished at last, and with the aid of an old negro caretaker was put into the water, sailed across the lake alone and without assistance other than the enthusiasm of youth, and landed at the dock of the Yacht Club amid the applause of the onlookers. Imagine if you can, the solemn pride of that moment. Imagine also

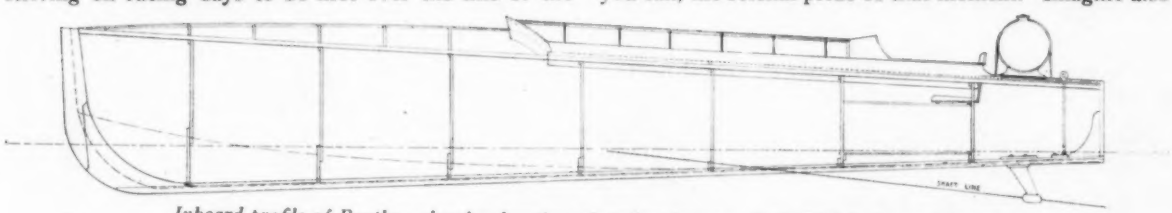
My Ideal Runabout

Panther, the tenth and last of the series of Ideal Runabouts, is a 20-foot hydroplane capable of a fair turn of speed.

In the January issue we will reproduce the plans of the ten Ideal Runabouts and give our subscribers an opportunity to register their preference. The amateur designer whose plans receive the greatest number of votes will be awarded a prize of $75 worth of boat equipment of his own selection.

Announcement

A new series of plans—My Ideal Auxiliary—will be started in the February issue of MoToR BoatinG. *As in the series just ending the designs must be by amateurs. Each issue will contain a complete design, including outboard profile, sections, lines, table of offsets, and description of an auxiliary. For each set of plans which we publish we will pay $35 in cash. In addition to this amount an attractive prize wil be awarded at the end of the series.* *See full detail's on page 56.*



Inboard profile of Panther, showing location of station frames. Scale 5/16-inch equals 1 foot

if you can the anguish that must have been mine the following day when the owner announced that he had sold the boat.

The following summer my father bought for me a little 16-foot hydroplane with a 6 h.p. motor which was able to make the remarkable time of 15 miles per hour. That was my start. My ideals have changed only toward the development of a speedier boat.

The plans accompanying this article represent to me the ideal two-passenger runabout. Having had experience with both types, I have decided that the concave V-bottom wave collector type possesses many advantages over the round-bottom boat.

It shall be 20 feet long with 5 feet beam, thus giving it increased stability, and, with the generous flare forward, make it a dry boat in a sea. It will be powered with a 90-100 h.p. four-cylinder Sterling motor equipped with electric starting and lighting system.

The motor will be set well aft on a white pine engine bed which, because of its lightness and ample strength, is much superior to oak. The bed will extend throughout the full length of the hull and useless weight eliminated by cutting oval holes of generous dimensions in the stringers. The five cross pieces of the engine bed will be cut to conform to the bottom of the hull to give increased stability and will be fastened to the stringers by bolts running entirely through their centers.

The motor will drive forward to a 1 to 1 ratio water-jacketed ball-bearing gear box with oil-tight stuffing boxes and from gear box through a no-bind stuffing box and strut to a Hyde turbine type propeller of manganese bronze. Drive shaft to be of cold rolled steel. Double rudders will be used made of 3/32-inch brass plate and rudder posts of 1-inch brass rods. The tillers will pass through slots in transom. They will be joined by a cross arm to which the steering cable is to be connected. A reverse gear will be mounted forward of the motor and connected to gear box by a jack shaft with flexible couplings. It is my expectation that this plan of motor installation in a hull of this design should develop a speed of from 35 to 40 m.p.h.

TABLE OF OFFSETS FOR PANTHER.

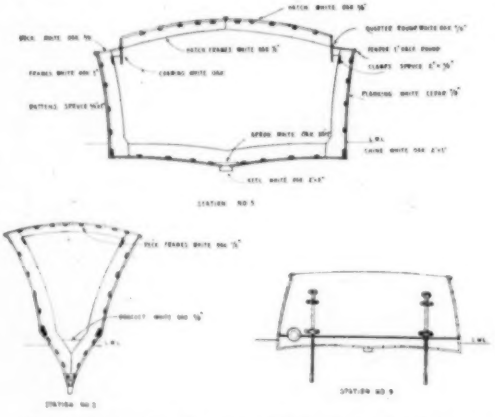
	STATIONS	1	2	3	4	5	6	7	8	9
HALF BREADTH	SHEER	4.04	3.11.0	5.9.5	3.8.0	3.6.5	3.5.0	3.3.1	3.2.0	3.0.1
	CHINE	2.6.1	1.11.4	1.7.5	1.6.9	1.5.1	1.4.6	1.5.3	1.4.3	1.7.2
	RABBET		1.0.1	1.1.4	1.2.7	1.4.0	1.5.0	1.5.7	1.6.7	1.7.7
	KEEL		0.10.5	0.11.6	1.1.0	1.2.4	1.3.2	1.5.0	1.6.6	1.7.4
HEIGHT ABOVE BASE LINE	SHEER	0.	1.4.1	2.1.2	2.4.0	2.6.0	2.4.1	2.2.5	1.11.4	1.6.0
	DIAG. A.		1.0.0	1.7.1	1.10.5	2.0.0	1.10.6	1.9.1	1.7.4	1.6.2
	DIAG. B.		0.10.1	1.4.3	1.8.4	1.9.7	1.10.6	1.9.4	1.7.3	1.6.6
	DIAG. C.		0.6.1	0.11.1	1.0.7	1.1.3	1.0.2	0.11.4	0.9.3	0.6.6
	RABBET		0.1.8	0.1.7	0.2.0	0.2.1	0.2.0	0.1.7	0.1.6	0.1.5

STATION NO. 5 IS AMIDSHIPS STATIONS SPACED 2'-6"
BASE LINE IS 6" BELOW WATER LINE
LENGTH 20' BEAM 5' DRAFT 11"
ALL DISTANCES IN FEET-INCHES AND EIGHTS TO OUTSIDE OF PLANKING

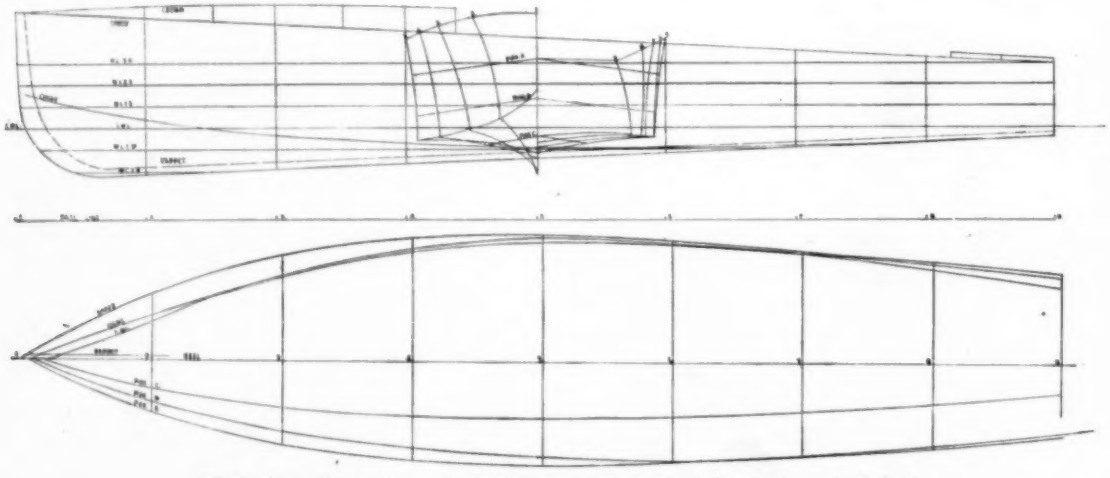
The keel and frame are to be of white oak and the planking of white cedar running full length of hull without butts. I figure that a boat of this design should be of fairly heavy construction, hence I have made my planking 5/8-inch in thickness.

The decking, coaming, and molding also is to be of white oak. The hull will be fastened with brass and bronze throughout. The cockpit will be finished with 1/2-inch white oak strips and the floor covered with battleship linoleum. All instruments, including ammeter switches, pressure gauges, etc., will be mounted on cowled white oak bulkhead. Steering gear will be automobile type mounted on port side. The hatch is to be of same material as decks and is to open outward, thus giving free access to motor compartment. It will be edged with a rubber strips and the seams battened to create a water-tight cover. Two seamless copper ventilators will be mounted forward on the hatch. For the sake of appearances four copper racing stacks will be mounted on hatch, although the exhaust will be carried out the transom through a Maxim silencer.

The outward appearance of the boat will be improved by four bronze ventilating ports. The deck is to be enameled white and edged and centered in golden oak. To my mind this treatment will produce a deck of striking appearance.



Sections showing construction at stations 2, 5 and 9. Scale 3/16-inch equals 1 foot



Water lines, diagonals and body plan of Panther. Scale 3/16-inch equals 1 foot

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions for the February Issue

1. Write an article encouraging owners and others to take up motor boating next season and to make their plans early.
Suggested by E. M. T., Bronx, New York.

2. Describe and illustrate a satisfactory and practical method of keeping provisions aboard when no ice is available.
Suggested by J. W. K. Jr., Jersey City, N. J.

3. Devise a scheme for cleaning the muffler and exhaust piping of salt, mud, carbon or other deposits without dissembling.
Suggested by W. B. M., Newburgh, N. Y.

EVERY reader of MoToR BoatinG is urged to participate in the Prize Contest. Every motor boat owner surely has his preferences for one or another kind of equipment, the lay-out of his boat and the care and handling of it. So why not give other motor boatmen the advantage of your individual experiences through the column of our Prize Contest Department? As both the questions and answers are contributed by our readers it is not exaggerating to say that MoToR BoatinG's Prize Contest is conducted by the readers themselves.

Heat the Best Cure for a Damp Magneto

Answer to the First Question in the October Issue

What is the best way to make a damp magneto work and how may it best be protected from dampness?

Heat Drives Out the Moisture

The Prize-Winning Answer.

WHEN all else failed, the owner of the balky mule, in the story, built a fire under him. Now this is precisely the remedy in the case of a balky magneto, when the cause of the trouble is dampness. Before resorting to such drastic measures, however, it is best to apply some ready-at-hand remedies which often have proved effective.

Dampness in a magneto is the result of water having been sprayed over it with the result that a few drops have seeped into some vital part or the moisture of the atmosphere has condensed upon some of the inner surfaces, which latter condition is known as "sweating." The first thing to do is to remove the distributor cover and distributor arm and wipe all high-tension surfaces —that is, insulating surfaces separating contacts—with a clean, dry cloth. The safety spark gap can be readily removed from most magnetos and all the insulating surfaces of this structure should be carefully wiped free from moisture. This procedure in many cases will remedy the trouble, but should it prove unavailing, a baking must be resorted to.

The heat in baking will cause the grease to run over adjacent surfaces, so first remove the breaker and distributor cover. If a cooking oven is available, place the magneto therein in its normal position to prevent unnecessary loss of grease and raise the temperature until the back of the hand can barely be held against the magneto and hold this temperature by frequent tests for one hour, when all moisure should be driven out. Care should be taken to raise the temperature slowly, especially if the magneto is very cold, to avoid "sweating."

If, however, an oven is not available, the magneto may be supported in its normal position over a flame, even a small fire, using the same care to control the temperature as above. After baking, wipe all greasy surfaces and be sure to replenish the lubricant as advised by the maker.

Probably the most effective method of protecting a magneto from moisture is to provide a casing of artificial leather such as is used for cushions and tops. Such a casing should be provided with snap fasteners to facilitate removal and the material should fit well around the leading-in wires.

The most practical way to go about the job is to have the cover tailor-made, so to speak. The material and fasteners will cost but a few cents, and with the magneto before him a tailor could quickly make a serviceable casing which will not only protect the magneto from moisture, dirt, and oil, but will not detract from the appearance of the installation.

J. F. C., Meriden, Conn.

Take the Magneto Apart and Bake the Parts

PRACTICALLY there is only one best way to make a damp magneto work satisfactorily. That is to get rid of the moisture. The method of doing this will vary with different makes and different types. The modern high and low tension magnetos have windings which are nearly water-proof. These may be put out of commission either by dampness penetrating the water-proofing or by short-circuiting the distributor. In the first case, it will be necessary to bake the water out. In the latter, disassembly of breaker box and distributor and careful wiping will effect a cure.

In the case of the non-water-proof type, the only rem-

Rules for the Prize Contest

ANSWERS to the above questions for the December issue addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before December 26; (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.
The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before December 26. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.
The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are two prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer both.
For answers which we print that do not win a prize we pay space rates.
For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.
All details connected with the ordering of the prizes selected by the winners must be handled by us.

edy is to bake the moisture out. This may be done by prolonged baking at a low heat in an oven. Care should be taken to keep the heat low enough so as not to injure the insulation of the coils. This baking can best be done with the device completely taken apart, heating only those parts which have windings attached to them.

As for protecting a magneto from dampness, some of the magneto covers now on the market answer very well. In addition to this cover, the windings may be protected as follows:

Heat the coils and windings at a very low temperature, say 120 to 130° F., for several hours. This will drive off any moisture which may happen to be present. Then with the parts still hot completely immerse them in a bath of melted paraffin. Keep the paraffin heated slightly above the melting point for two hours. Remove parts and allow all superfluous wax to drain off as they cool. When cool carefully remove all paraffin from bearing and contact surfaces.

On reassembling the magneto will be found practically water-proof, but should be protected from all dampness and spray by one of the covers mentioned above.

H. H. B., Schenectady, N. Y.

Restoring a Damp Magneto

MAKING a damp magneto function properly without undue delay may or may not be possible, depending upon the amount of moisture present and the extent to which it has penetrated unprotected windings.

The proper methods for restoring a damp generator is a thorough drying, best accomplished by placing the magneto in a hot room or near a fire and causing warm air to circulate through and around it by means of an electric fan or other device. Never place any piece of electrical equipment in an oven or where the temperature is more than can be borne by passing the hand against the surface.

To dry out a damp magneto may require from a few minutes to a week, according to the extent of the moisture, and the boat must be laid up or operated on current from another source for that time. When the magneto has only received a shower of spray or water in sufficient quantities to interfere with its operation, or has been left unprotected in a damp place, it may often be dried out without removing the equipment by thoroughly wiping all parts and forcing a current of warm air around and through the windings.

Air directly from an air pump that has run until nicely warmed up or from an accumulator drawing the pressure from the cylinders will soon dry off a damp armature and other parts. When dry, a light sanding with No. 00 sandpaper will restore the surface of the commutator and other collecting or distributing parts. Never use emery cloth or paper on any part of the machine. The emery is too sharp and should it lodge will continue to cut, causing unnecessary damage. In extreme cases it is advisable to send the machine to the factory for repairs. Under normal working conditions any electrical generator should warm up in a short time sufficient to expel what little moisture will collect.

The absorption of moisture by the windings is best prevented by saturating them with a dielectric, waterproofing compound and the thin film of lubricant on the commutator, etc., will prevent the collection of dampness there.

A damp-proof insulating varnish for dynamos or magnetos may be made by thoroughly mixing shellac gum, four parts; sandarac, two parts; linoleic acid, two parts, and alcohol, fifteen parts.

Most magnetos of late design are enclosed so as to protect the windings, commutator, etc., from water and dampness and such machines will not be troubled unless submerged. A cover as neat as furnished by the manufacturers can hardly be made without special equipment but an efficient cover may be made from sheet metal if not allowed to touch any part of the generator. A rubber cover made like a bag so as to draw, closed with a string, will also answer the purpose.

W. B. M., Newburgh, N. Y.

Seaworthiness and Dependability Desirable and Necessary

Answer to the Second Question in the October Issue

"Describe and illustrate what you consider the most desirable feature of your motor boat."

A Self-Bailing Cockpit Indispensable

The Prize-Winning Answer.

IN reviewing the various structural details incorporated into our 36-footer, most of which have demonstrated some degree of worth during her two seasons afloat, it seems that the self-bailing cockpit is the outstanding feature which has proven most indispensable. Not that we have driven the boat through desperate storms which constantly filled it to the rail. On the contrary, nothing but spray in negligible quantities has ever come over its high protecting sides. Indeed, a storm which would fill that cockpit at all would be too strenuous an affair to trifle with, except from dire necessity. But the confidence which comes of having a craft which is able to handle almost any amount of water which may tumble into her, to us is an asset of real value in a craft used for pleasure purposes.

Another advantage which has been brought to our attention is the freedom from annoyance caused by heavy rains. At a neighboring mooring lies a 30-foot trunk cabin boat having an ordinary cockpit of liberal size. High cabin doors run down to its floor level, below the waterline. During every storm the rain which enters the cockpit drains through the floor boards and thence into the cabin, overflowing the cabin floor and messing things up generally. We frequently note that the trim little craft is badly down by the head owing to the excess rain water which accumulates before the owner has opportunity to pump it out. The self-bailing cockpit relieves an owner of such trying experiences.

Our gasoline tanks stand in saddles on the cockpit floor, one on each side so that any leakage from them (of which there has happily been none) will run overboard by the rain water route, a safety measure which is worth while. Broad seats or benches cover the tanks, each with a filling plate near the forward end. The handling of gasoline cans in this sheltered cockpit is as easy as such a task can be made. Easier and pleasanter, for example, than filling a tank way up forward on a well-crowned deck with a stray breeze to complicate the situation. The tanks themselves are of heavy copper and cylindrical in shape with swash plates which absolutely prevent any noise or danger from the fuel supply in rough water. The seats are removable as also are the mahogany screens in front, which, while affording ample ventilation, hide the tanks from view and make the cockpit much more attractive in appearance. The tanks may be moved out into the cockpit should inspection or repairs become necessary. Small copper vent

pipes run up high in the after corners of the cockpit and the top ends are turned down to keep moisture out of the tanks.

The cockpit is drained by four 2-inch lead pipe scuppers located in the corners. Leather flap valves over the outlets prevent any possible inflow of water. The floor is raised a foot above the waterline and this gives perfect self-bailing qualities.

The construction of the cockpit is very substantial, the idea being to make it rigid, thus preventing leaks, and to add to the strength and stiffness of the hull.

A narrow bridge deck across the forward end raises the forward cabin door sill over two feet above the cockpit floor and makes a good step when going forward. It also adds acceptable headroom above the reverse gear, below. The steeering wheel is mounted on this bridge deck in a square mahogany box with binnacle built into the top. This is centrally located. The door to the after cabin also has a high sill and is entered by means of a step supported on two brackets. A rotary hand bilge pump is at the port side of the bridge deck and is operated from the cockpit, with the discharge piped outboard. A power bilge pump is operated by the motor, thus giving a double pumping service, each unit of which is much more powerful than usually fitted.

In the center of the cockpit floor is located a flush bronze manhole plate with a 22-inch opening which gives access to the storage space beneath. This closes water-tight and is a very convenient feature.

We find the size of the cockpit ample for every requirement. The measurements are about 8 feet long and 8 feet wide inside, although the bridge deck takes out 18 inches of seating space, making the side seats 6 feet 6 inches in length; just right, as you will note, to lie down on if desired. The impression given is one of roominess and ample outdoor space is afforded even for extended cruising. So well did all the details work out that it is difficult to suggest improvements.

A. O. G., Portland, Me.

Dependability the Most Desirable Feature of a Boat

TO select just one feature of any well designed and equipped motor boat and call it the most desirable feature of the whole outfit would be to overlook that which the naval architects and the motor manufacturers try hardest to put into their product —dependability.

Seaworthiness, uninterrupted and economical motor operation are of prime importance. Then there are comforts and conveniences; covering berths, seats, lockers, galley, awnings, and curtains, steering position and seat—all more or less of a comfort—motor control leads, air whistle, power bilge pump, running hot and cold water, electric lights and self starter, all very convenient; but what would you give for a boat having them all and lacking dependability?

Seaworthiness is a feature of design and can seldom be corrected if found wanting without reconstructing the whole boat. This point must not be under-estimated. It must be put into the boat when it is designed. If you have a boat that is known to be unseaworthy, sell it for what you can get, or, better still, dismantle it and use the hull in the club fireplace.

The continuous operation of a good motor is assured when properly installed and cared for. A cheap engine after a few years' use or one that is worn out will not continue to operate satisfactorily even with continuous tinkering and adjusting. Tinkering is to be avoided in any event, although intelligent attention (this is not tinkering) will do much towards keeping any motor in condition.

Conditions affecting the operation of a motor begin with the installation. The engine bed must be of sufficient strength and have ample bearing on the keel and frames to support the weight of the installation and prevent undue vibration. A motor improperly aligned cannot continue in good service. Hard starting, undue friction and vibration and worn bearings will be the result. The alignment should be "right there" and the job ought not to be done until the boat has been in the water several days so that any change in shape will not throw out the alignment. Realigning every Spring is essential but often neglected.

The gasoline supply is important. A stoppage in the fuel line will cause trouble and delay and it is often hard to remove. Use a gauze cone in the tank and a good strainer at the carbureter and the fuel supply is assured as long as there is any in the tank.

Given gas and spark any motor will run, but without either at the proper time, operation is uncertain if not impossible. The breaker, distributor, and commutator (not all on one motor) need the attention on a high-tension ignition system. Keep the contact points clean and making good contact. The contacts on a vibrator system must be kept clean and not allowed to become so pitted as to stick.

All bearings should be kept adjusted and the valves ground in, and the oil level kept between limits.

When the gas, spark, and mechanical features of a motor are given proper attention, economical operation will follow the intelligent adjustment of spark and gas. A heater or hot air intake cannot be too strongly advised. The operation of the motor accessories is a matter of quality and installation. Given the same intelligent attention as the motor, the same efficient operation may be expected.

Given a good boat, properly designed and constructed, the consensus of opinion would seem to be that the smooth uninterrupted operation of the power plant and its accessories — dependability — is the most desirable feature of any motor boat.

After trying out a boat having this feature and one lacking it, you will agree that no matter how nicely finished and equipped, a boat that is not dependable is not worthy of the name motor boat and is only an ornament to the club anchorage.

W. B. M., Newburgh, N. Y.

A Combination of Desirable Features

THE ideal boat consists of a combination of desirable features, any one of which is essential, so it is a matter of personal preference as to which is considered most desirable. Naturally, each owner is satisfied that his cabin plan, equipment, etc., is the best possible under the circumstances. By selecting and combining the best ideas of various designs one will obtain the best results. When planning my raised-deck cruiser I

MoToR BoatinG

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(See Complete Table of Contents on Page 90)

studied designs and descriptions printed in MoToR BoatinG, inspected boats of various kinds to get the benefit of the experience of others, and my design represents a combination of tried-out ideas that, in use, has left nothing to be desired.

A most desirable feature of my plan is that three separate sleeping compartments are provided (two with separate entrances to the toilet room), as well as ample protected cockpit space for day use. MoToR BoatinG of January, 1914, printed a cut and description of my cabin plan.

A supply of fresh, running water is not only desirable but essential on a cruiser. In my boat a tank located over the engine, in space otherwise unusable, furnishes water, by gravity feed, to the lavatory in the toilet room and sink in the galley. MoToR BoatinG of October, 1911, printed cuts and a description of my system.

My galley is located amidships, forward of the engine-room and aft of the stateroom. Cooking odors are thereby kept from the main sleeping compartment, and danger from engine-room vapors being ignited from the stove is practically eliminated. The galley should never be located in the engine-room when it is possible to locate it elsewhere.

A combination of port lights in the raised deck section and sash windows in the engine-room provides a safe and dry bow cabin, with ample light and ventilation for the engine-room. A roomy ice-box in the cockpit is easily accessible and keeps the contents out of the heat and away from the odors of the below-deck compartments. It also serves as a seat.

All well-equipped boats have a satisfactory electric lighting and ignition system. Also bulkhead controls at the steering wheel. These, too, are not only desirable but necessary. Therefore, it seems to me that no one single item in a boat's equipment can be said to be more desirable than all others. Things are good or bad only by comparison. Boats will differ as owners differ.

H. G. L., Baltimore, Md.

A good design most desirable

WHAT is the most desirable feature of your motor boat? That is a question much easier asked than answered by a motor boat enthusiast. He may say, and truthfully, that his entire boat is more desirable than any he has yet seen. Though not quite as ideal as the one he has in mind to build at some day.

One desirable, and necessary, feature of any boat irrespective of size or type is a reliable power plant, but if the hull does not suit the purpose for which it is used the best of power plants will not give the owner much satisfaction, so I would put the design and lay-out of the hull at the head of the list. For myself I prefer a cruiser to any other type of boat, so I will attempt to express my preferences as I have learned them by experience.

In the first place, I do not believe a real comfortable cruiser has yet been built that will travel over ten or twelve miles per hour. If a boat is going to be used for real cruising, in good weather and bad, in protected waters and open seas, the hull must have considerable beam; from one-fourth to one-fifth of the length. The hull must be full bodied and deep or it will bob around like a cork. The shallow draft hull is all right for speed or on quiet waters, but in a sea it will roll much too quickly to be comfortable.

As to the lines, the bow should be just a little bluff and have considerable reserve buoyancy above the waterline or it will not rise properly in a seaway. Nothing is more disagreable than a boat that has not sufficient buoyancy forward to keep it from digging into the waves instead of rising up over them. A full bow may reduce the speed just a little, but in heavy weather will prove its worth.

The midship sections should not be too flat or the boat will pound every time it goes over a big one. Then, too, a deep hull gives more headroom in the cabin. When it comes to the stern I much prefer the transom type, but not with flat underbody section or too broad a transom. If the after sections are too broad they have too much buoyancy to allow the bow to raise to a head sea. A deep keel and deadwood are a great advantage when running before a sea. It keeps the boat from yawing off its course with every wave and saves the helmsman much work with the wheel.

Personally, I prefer to have all of the motor except the flywheel under the cockpit floor, and covered with a good size engine hatch with a water-tight coaming about six inches high. This gives ample working space about the motor and still protects it from water. The door sill of the companionway should also be built up several inches above the deck level, to prevent water running into the cabin.

D. L. R., New York, N. Y.

Mystery Ships Go 60 Miles an Hour—Two Days Across the Atlantic

FOR some time past MoToR BoatinG has known of startling developments in the design and speed of a certain type of boat said to be produced by the British Government. Statements made by authorities had it that one of these boats had made the trip across the Atlantic in two days with a British high official aboard and had returned him to his office in less than five days from the time he embarked for America.

In the New York American of November 22, E. G. Fitzhamon, staff correspondent of the Universal Service, states that on the highest authority, they have learned these "mystery ships", of which hitherto only hints have been allowed to filter out of the censor's office, represent the British naval architects' most notable contribution to the war's wonders. It is claimed that only three of these floating marvels have been built and that Foreign Minister Balfour was rushed across the Atlantic in less than three days. This was at the time the Siberian situation was so acute that it made the presence of the British Foreign Minister in Washington imperative.

It is stated on excellent authority these three "mystery ships" are considerably larger than destroyers. It is asserted the ships have attained fifty-four knots in special tests and more than 1,000 a day, in all sorts of weather, in Atlantic waters.

How the Diesel Engine Proves In

A Type of Power Plant Which Is Sure to Come to Replace the Wasteful Steam Plant

By Herbert Haas

Although it is doubtful whether the Diesel engine will ever replace the gasoline power plant in the types of cruisers and pleasure craft with which we are familiar, yet there is a great amount of interest among motor boat owners in this type of motor. The transportation and shipping interests also have an eye on the development of the Diesel with a view of replacing many of their steam installations when the proper time arrives. The article printed on these pages is condensed from the United States Bureau of Mines Bulletin 156, which is the most exhaustive and complete treatise on the subject we have seen. The article will be concluded in the January issue of MoToR BoatinG.—Editor.

THE DIESEL engine, a comparatively new type of internal combustion engine, is an important device for insuring more efficient utilization of petroleum and coal-tar products, for it consumes heavy liquid fuels such as cannot be utilized in other types. Like the gas or the gasoline engine, it is revolutionary within its province. For some uses this engine is replacing gas and gasoline engines, but its most important duty will be to replace the wasteful consumption of fuel oil in steam engines. Not only will a wider use of the Diesel engine relieve the demand, but it will result in more power being obtained from the same consumption of fuel oils. In spite of these advantages, comparatively few Diesel engines are in use in the United States.

The term "oil engine," as generally used at the present time, is applied to internal combustion engines that burn directly in the cylinder heavy liquid fuels of high boiling points, the fuel being injected into the compressed air shortly before or at the completion of the compression stroke. The heat of compression is used to ignite the fuel.

In the heavy-oil engine the vaporizing of the fuel takes place inside of the engine. As a fuel with a high boiling point cannot be evaporated at moderate temperatures, thorough mechanical division preceding ignition and combustion is necessary.

Three General Types of Liquid-Fuel Engines

According to the means used for atomizing the liquid fuels and igniting them, there are two mechanically and thermodynamically distinct types of engines. In one type the entire fuel charge is sprayed against a highly heated surface in a chamber connected with the working cylinder. Contact with this highly heated surface gasifies the fuel, which is ignited and burns with explosion-like rapidity. Engines of this type are properly termed "explosion oil engines," or engines in which the fuel is burned at constant volume.

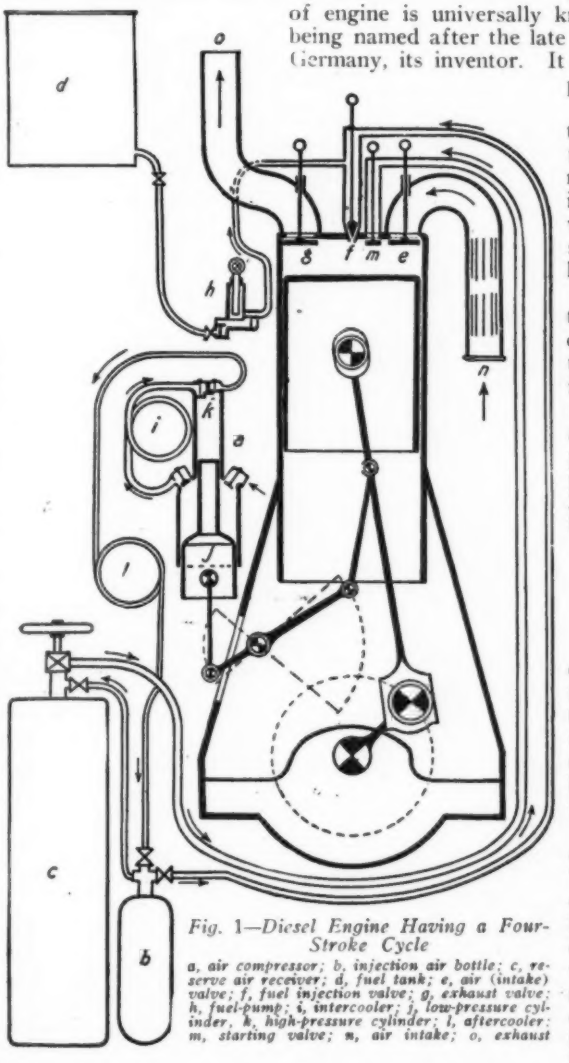


Fig. 1—Diesel Engine Having a Four-Stroke Cycle

a, air compressor; b, injection air bottle; c, reserve air receiver; d, fuel tank; e, air (intake) valve; f, fuel injection valve; g, exhaust valve; h, fuel-pump; i, intercooler; j, low-pressure cylinder, k, high-pressure cylinder; l, aftercooler; m, starting valve; n, air intake; o, exhaust

In engines of the other type the fuel to be converted is finely subdivided by air, and in this state of atomization is injected directly into the engine cylinder, where it is ignited automatically by the highly heated air in the cylinder. The combustion is not explosion-like, but is prolonged at constant pressure for the entire period during which the fuel is injected into the cylinder. This type of engine is universally known as the Diesel engine, being named after the late Rudolph Diesel of Munich, Germany, its inventor. It is also termed a "constant-pressure oil engine."

There is a third general type of engine, combining features of the two types mentioned, in which the fuel is burned at both constant volume and constant pressure. Engines of this type are known as Sabathé engines.

In explosion oil engines, the air is compressed in the cylinder to a pressure of 145 to 220 pounds per square inch and in the crankcase (two-stroke cycle engine) to a pressure of 1 to 7 pounds per square inch. The explosion pressure varies from 270 to 470 pounds per square inch.

Diesel Engines
FOUR-STROKE CYCLE

Fig. 1 shows the elements of a Diesel engine having a four-stroke cycle. Important adjuncts of the engine comprise a two-stage air compressor *a*, air-injection bottle *b*, compressed-air container *c*, and fuel oil tank *d*.

The engine piston has started on its downward travel. The air-admission valve *e* is open to the atmosphere and lets air into the engine cylinder. On its return stroke the valve *e* and all other valves are closed, so that the piston compresses the air in the cylinder to a pressure of 450 to 500 pounds per square inch. As a result the air becomes highly heated, its temperature rising to about 1,000 degrees Fahrenheit when the highest pressure is reached. When the piston is at its upper dead center, the fuel-injection valve *f* is opened and liquid fuel in a volume proportioned to the load of the engine is forced into the cylinder, where, meeting the

highly heated air, it automatically ignites and burns. When an automatically regulated supply of fuel has been delivered, valve *f* closes.

Pump *h* is under the influence of the engine governor, by which the volume of fuel delivered is proportioned to the load of the engine. The fuel oil stored in tank *d* flows by gravity to the pump, which delivers a measured quantity of oil to the fuel injector *f* during the suction stroke of the engine piston, while the needle-valve of the injector is closed. The fuel injector is connected with the small air receiver *b*, in which air under a pressure of 700 to 900 pounds per square inch is stored, and air at this pressure always fills the valve chamber around the valve stem of the fuel injector.

Pump *h* in delivering its measured quantity of oil fuel to the injector must overcome the air pressure within the valve chamber. The pump is, therefore, designed to deliver the oil at a pressure of 100 to 200 pounds per square inch higher than the pressure of the air from the tank *b*, or at a pressure of 800 to 1,100 pounds per square inch. The fuel oil is delivered near the bottom of the fuel injector, immediately above the needle-valve. When this needle-valve is opened the injection air, which is at a pressure nearly double that of the compressed air in the engine cylinder at the completion of the compression stroke, atomizes the fuel oil and carries it into the engine cylinder. The injection air thus serves two important functions, namely, to inject the fuel into the cylinder and to subdivide it finely. The latter function is by far the more important, as on its efficiency greatly depends the success with which the heavy liquid fuels are burned. The fuel could be injected by direct pump pressure, but unless thoroughly atomized by highly compressed air it would burn only partly and after-ignition would result.

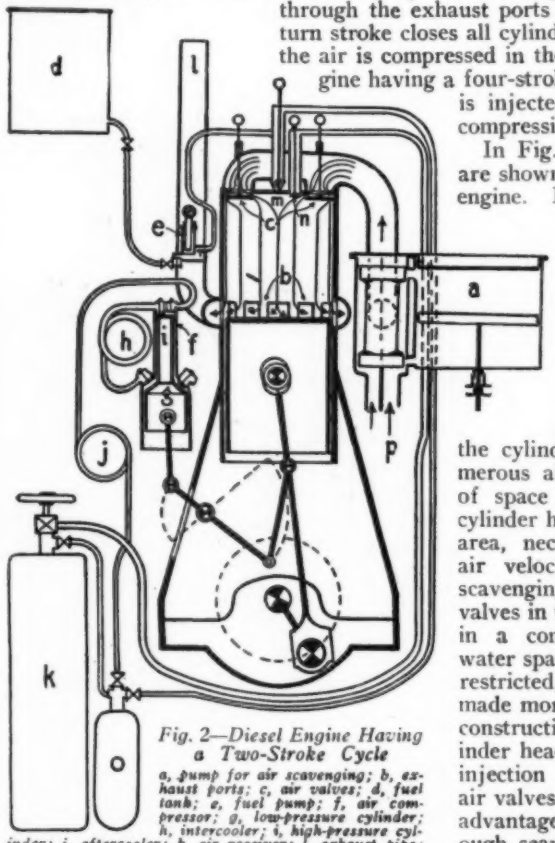


Fig. 2—Diesel Engine Having a Two-Stroke Cycle

a, pump for air scavenging; b, exhaust ports; c, air valves; d, fuel tank; e, fuel pump; f, air compressor; g, low-pressure cylinder; h, intercooler; i, high-pressure cylinder; j, aftercooler; k, air receiver; l, exhaust pipe; m, fuel injection valve; n, starting air valve; o, injection air bottle; p, air inlet pipe

The two-stage air compressor *a* furnishes the injection air; *i* is an intercooler to cool the air from the low-pressure cylinder *j* to atmospheric temperature before delivering it to the high-pressure cylinder *k*; *l* is an aftercooler to deliver cold air to tanks *b* and *c*. As previously mentioned, in the compressor the atmospheric air is brought to a pressure of 700 to 1,000 pounds per square inch. The air receiver *b* provides reserve air storage. Air is drawn from it whenever the engine is started and is delivered through the starting valve *m*, when the piston is at the upper dead center, in position to receive a power impulse. After the engine has been started, tank *c* is recharged from tank *b*, by working the air compressor at its full capacity for 15 to 20 minutes. When the desired air pressure has been restored in tank *c*, all valves leading to and from the tank are closed. The air-inlet pipe is shown at *n* and the exhaust pipe at *o*.

Starting a Diesel engine from no load to full load, or reversing them, requires one to three minutes, depending on the size and the construction of the engine.

Two-Stroke Cycle

Fig. 2 shows the elements of a Diesel engine with a two-stroke cycle. It differs from the engine just described in that it has a scavenging air pump *a* and exhaust ports *b*, arranged around the cylinder walls, covered and uncovered by the piston in its upward and downward travel, and two or more air-admission valves in the cylinder head.

The scavenging air pump *a* is double-acting and its air delivery is controlled mechanically by a piston-valve The air admission to the engine cylinder is mechanically controlled by two or more air valves *c* in the cylinder head. The scavenging air is compressed to a pressure of 3 to 7 pounds per square inch.

The air is admitted into the working cylinder as soon as the exhaust ports have been uncovered by the piston; the cylinder, full of the gaseous products of combustion, is cleared by the scavenging air, which sweeps out through the exhaust ports *b*. As the piston on its return stroke closes all cylinder valves and exhaust ports. the air is compressed in the same manner as in the engine having a four-stroke cycle, and the fuel charge is injected on the completion of the compression stroke.

In Fig. 2 the air-admission valves are shown in the cylinder head of the engine. In some later engines these scavenging air valves have been placed in the cylinder wall opposite the exhaust ports. The piston is shaped so as to direct the travel of the scavenging air in the cylinder and to arrange it in currents that sweep the cylinder clean of the products of combustion. Thus the cylinder head is relieved of numerous air valves, which, by reason of space limitations imposed by the cylinder head, have to be of restricted area, necessitating greatly increased air velocities to effect the desired scavenging. The placing of these valves in the cylinder head also results in a complicated head casting, the water spaces of which are narrow and restricted, so that effective cooling is made more difficult. By the modified construction above mentioned, the cylinder head has only starting and fuel injection valves. The placing of the air valves in the cylinder head has the advantage of insuring a more thorough scavenging, as the air, entering at the top of the cylinder, will more effectively sweep before it the burned gases from the previous combustion.

Sabathé Engines

Sabathé engines differ from the Diesel engines described only in the method of admitting fuel and that of timing ignition, these being accomplished by a fuel-injection valve and a governor of a construction peculiar to these engines. A part of the fuel is admitted before the upper dead center of the piston is reached, and burns with constant volume. The remainder is admitted at the completion and return of the stroke, and burns at constant pressure. If the engine load diminishes, the fuel admitted during the second, or constant-pressure, period is diminished, stopping entirely during low load when the only fuel admitted is burned at constant

volume, or as near so as is practically possible.

The peculiarity of the working cycle of these engines is well illustrated in the pressure-volume diagram shown in Fig. 3. The burning of the fuel is accomplished at constant volume as represented by the line *bc*, and at constant pressure as represented by the line *cc'*. The fuel, of course, is not introduced intermittently at *b* and *c*, but is admitted continuously, the burning at constant volume and pressure being controlled by the action and timing of the needle-valve, under the influence of the governor, at predetermined positions of the piston. Line *cc'* varies in magnitude with the load. At low load, line *cc'* disappears entirely; then the diagram becomes similar to that of an ordinary explosion oil engine.

Actual diagrams differ from the theoretical one shown in Fig. 3. In reality it is not possible to burn the fuel so quickly that it burns at constant volume. Line *bc* therefore inclines slightly toward the expansion line. The properties of the fuel, whether it burns readily or slowly, the temperature in the cylinder, and the means used for its ignition all influence the burning process. A part of the fuel usually does not burn until expansion has begun.

Likewise, in Diesel engine diagrams, there is no perfect constant-pressure line. With the admission of the fuel there is a slight increase in pressure; there is also an after-burning of incompletely burned fuel when expansion has started, so that the initial and the terminal parts of the constant pressure line are slightly curved.

In explosion oil engines the constant volume line *bc* of Fig. 3 is shortened, and the diagram area is decreased, with a decrease in the fuel supply during fractional loading of the engine.

In the Diesel engine the constant pressure line is shortened, and the diagram area decreased, with partial loads. In some two-stroke engines that increase the specific duty by increasing the scavenging air pressure, that is, by pumping a greater weight of air into the working cylinder, the compression pressure is variable, and decreases with a decrease in load to the minimum required for satisfactory burning of the fuel. Fig. 4 shows actual indicator diagrams for different loads of a Diesel engine having a four-stroke cycle.

Comparative Advantages of the Cycles

As regards the relative theoretical advantages of the four-stroke and the two-stroke engine, the two-stroke engine appears to be superior. For a given cylinder size and speed, the specific duty of an engine having a two-stroke cycle is double that of an engine having a four-stroke cycle, for it receives a power impulse for every revolution as against one for every two revolutions of the engine having a four-stroke cycle. Its mechanical efficiency also would appear to be greater, as the engine with a four-stroke cycle has to make two strokes for expelling the products of combustion and for filling the cylinder with a fresh supply of air for burning the next fuel charge. The power for this work has to be drawn from the flywheel, in which it has to be stored again during the power stroke. As in addition the cyclic regularity of an engine with a four-stroke cycle but having the same power and speed is greatly less, a much heavier flywheel is required. The four-stroke engine is also much heavier per horsepower than the two-stroke engine.

In practice, however, these advantages are not so apparent. Engines having a two-stroke cycle require an auxiliary air pump for performing the work of scavenging and of refilling the working cylinder with fresh air, work that in the engine having a four-stroke cycle is performed by the engine directly in the working cylinder. The air pump, proportioned to the engine it has to supply, is a large and heavy piece of machinery, requiring considerable power for its operation. To insure thorough scavenging of the working cylinder, a volume of fresh air greater than the volume of the cylinder must be supplied by the air pump. The pump is usually proportioned to supply one and three-tenths times the working cylinder volume of air. Even then sweeping of the working cylinder clean of the remnants of the products of combustion is difficult, and any gases remaining in the cylinder displace a proportionate amount of oxygen needed to maintain combustion, thus lowering the possible power output of the engine.

The heat exchange in an engine having a two-stroke cycle being more rapid than in one having a four-stroke cycle, the material of the former is more severely taxed, and it is not advisable to use as high mean effective pressures or piston speeds as in engines having a four-stroke cycle. High mean effective pressure results in high terminal pressure at the time of exhausting, with a consequent loss in power. As the exhaust ports of two-stroke engines are uncovered by the piston, and as exhausting of the gases must be rapid, the piston has to uncover these ports several degrees before it reaches its lower dead center. High mean effective pressure will therefore cause proportionately greater losses in an engine having a two-stroke cycle than in one having a four-stroke cycle. These features combine to diminish the theoretical advantages that engines having a two-stroke cycle appear to possess over engines with the simpler four-stroke cycle.

To avoid any misconception it is well to emphasize that the difficulties and the considerable fuel losses during exhausting experienced with the usual two-stroke gas engine, chiefly on account of the successive scavenging and loading of the engine cylinder, are absent in the two-stroke Diesel engine. In this engine the same air pump does the scavenging and the charging, whereas in the two-stroke gas engine separate pumps are used for scavenging and for charging the cylinder with the gas-and-air mixture. These pumps consume considerable power, and it is difficult to prevent a part of the fresh gas air charge from being expelled with the products of combustion during exhausting. Having to deal with inert air (air not mixed with any combustible gas) and a liquid fuel, the working process of the two-stroke cycle Diesel engine is much simpler than that of the gas engine having a two-stroke cycle.

Engines with a four-stroke cycle, in sizes from 50 to 800 h.p.,* have been developed to a high degree of perfection, and are so simple in operation that little justification for the adoption of two-stroke engines in these sizes exists at present. The field of two-stroke type lies chiefly in engines of very small and very large powers, the latter from 1,000 h.p. upward.

Engines of Small Power

Diesel engines, to insure high fuel economy, demand mechanically operated valves, and a high-pressure air compressor, which, together with the high-compression and resulting high temperatures used, demand the highest grade materials and workmanship, involving a high cost per horsepower.

Although in European countries Diesel engines are manufactured in sizes as small as 15 h.p. there is little demand for this size in America, where fuel prices generally range lower, and where Diesel engines of 75 h.p. indicate the probable commercial limit in size. For large powers, from 1,000 h.p. upward, engines having a two-stroke cycle are preferred, as in these sizes limitations are put on the size of cylinder practical for engines having a four-stroke cycle by the high temperatures and pressure produced in such engines.

(*To be continued*)

Opportunities of the National Association Greatly Magnified

With the Coming of Peace the Importance of a Representative Organization of Manufacturers and Builders Becomes Very Great

By Ira Hand
Secretary N. A. E. & B. M.

This is the second article published in MoToR BoatinG written by Mr. Hand, Secretary of the National Association of Engine and Boat Manufacturers, at our special request. Although copies of Mr. Hand's first article were furnished by the writer to some of the other publications, yet MoToR BoatinG was the only one to make use of it over Mr. Hand's name.

The points brought out this month by Mr. Hand are especially interesting and important. They have a direct bearing on the future of every manufacturer's business.

MoToR BoatinG believes in the National Association of Engine and Boat Manufacturers, believes in its objects and importance. We also believe that the Association is worthy of the great task which is before it these days—that it will take advantage of the great opportunities and formulate plans at once to lead the industry in all its branches to that successful condition of affairs that is almost within their grasp.

—Editor.

COINCIDENT with the abrupt ending of the world war and the glorious record of our country in the stimulus that our entry into this conflict gave to our Allies in their successful efforts toward the complete demoralization of Prussian autocracy, there comes to our manufacturers and builders a problem that, in its way, is fully as serious as that which confronted them in their business operations while the war was in progress. The gradual tightening of the materials market, coupled with an almost complete cessation of new business in their particular lines threatened to seriously cripple the motor boat industry in this country. Skilled labor found a ready market in other lines that were deemed essential and not only were production organizations sadly depleted, but even those of our manufacturers who, in a desperate effort to keep their organizations intact, turned their attention to securing war orders, found extreme difficulty in keeping their equipment going at the peak load.

Over-night, a new viewpoint must be taken into consideration. War orders are being cancelled right and left, and labor, that had made its readjustment territorially and otherwise, finds itself facing a reconstruction era that contains for the present at least no promise of extreme high wages, over-time, bonuses, etc., such as obtained while our country was at war.

That there will be prosperity, and a real prosperity, in so far as the resumption of our temporarily discontinued manufactures may be concerned is true without a doubt. The prospect of a real lasting peace has been brought before us even sooner than the most optimistic among us might have been led to expect it. Peace means an opportunity to develop our plans for work and recreation as they may seem best suited to each individual. This applies to a greater proportionate degree to the motor boat industry than to any other industry in this country today. Hundreds of thousands of men, women and children who have accorded the sport of motor boating and yachting its proper place in their affections have had to stifle for a year or more past their inherent desires to get out on the water during their hours of relaxation. Many others, fortunately so placed that they might benefit by financial conditions brought about by the war, will be seeking some way, possibly a new way to them, of spending some of their surplus funds in the attainment of real enjoyment for themselves and for their families.

As for our yachtsmen in the service, there are thousands of them who will want to immediately return to their old pursuit of happiness on the water when they come back to their homes. There are tens of thousands of others of our boys who, up to the time that this war made its call upon them, had never been in a boat of any kind. Many of these boys have by preference entered the Navy or one of its many branches and have thus been brought face to face with the tremendous possibilities for enjoyment in boating of all kinds. There lies the new market for the American motor boat and marine engine builders, a market deliberately created for them by a force of circumstances that will ultimately prove to be most fortunate for the industry.

Let the trade then, as quickly as may be possible, ascertain its true status and speculate upon its possibilities for the immediate future. The manufacturer who prepares himself for the big business that is to come is the one who will get the major share of that same big business. Judicious advertising on a carefully thought out basis will be bound to bring results and coupling this with a sanely developed policy of production and sales there can be no doubt but that prosperity will come to our industry in a greater measure than ever before.

B. M. Baruch, head of the War Industries Board, in an interview printed in a current issue of our newspapers, sums up one phase of this situation as follows: "The opinion is expressed that the lesson of conservation the war has taught ought to be applied in peace. The experience of the War Industries Board indicated that industrial output by standardization and a simplification of patterns and designs, which are mostly furbelows, could be maintained at a given volume with ten per cent. less material and labor." Nowhere does this observation strike home more forcibly than in the motor boat industry. Another item in today's paper states that readjustment of the coast patrol to a peace time basis will be one of the first changes to be made by the Navy Department. Secretary Daniels, according to report, has indicated that as soon as possible, the Navy Department will release to their original owners the hundreds of yachts and large motor boats that have been used on guard duty in Atlantic waters. Assuredly these former private yachts are not now in the condition that their owners might wish them for private purposes. Interior remodeling must take place and very likely the engines and other parts of the equipment will need either overhauling or replacement.

Boat Building Yards Busy On Important Work

No Curtailment of Government Contracts Likely—Prospects for New Work Never Better—Some of the Construction Now Going On

William G. Abbott, Milford, Del. One wooden fishing boat, 130x21x10 feet. Two wooden fishing boats, 130x22x10 feet.

Adams Shipbuilding Co., East Boothbay, Me. One wooden three-masted schooner, 140 feet keel by 33 feet by 13 feet, 425 gross tons, 800 tons d.w. John G. Alden, designer.

American Boat Co., Detroit, Mich. At present engaged in building 16-foot work boats for the Emergency Fleet Corporation, is also doing a lot of repairing and rebuilding for the Great Lakes Service Patrol Fleet. Has approximately 1,000 feet of dockage, slips for ten large boats, ten boat wells also ground sufficient to store about seventy-five boats ranging in size from 45 to 100 feet for winter. Specializes on a very high grade dinghy called the American Beauty and will also market a speedy runabout now that the war is won. Has also built a number of 65-foot cruisers and also a number of 45-foot fish tugs and ferry boats of different sizes. Has two marine ways and one crane. This company says it will continue to do a general repair business on all types of wooden boats up to 125 feet which will not in any way interfere with the building of new boats.

Astoria Boat Co., Aberdeen, Wash. Three launches. One 56 feet with 50 h.p. engine. One 56 feet with 35 h.p. Atlas Imperial engine, for Schmidt & Company. One 35 feet with 25 h.p. Eastern Standard engine, for the Deep River Logging Company.

Canadian Beaver Co., Toronto, Ont., Can. Several large motor-powered life-boats, 24 feet o.a. x 7 feet, 12 h.p., gas motors, capacity thirty persons, for ships now building at Polson Iron Works, for the Norwegian Government.

Cape Cod Dory Co., Wareham, Mass. Two hundred 20-foot dories for the U. S. Navy.

Chance Marine Construction Co., Eastport, Annapolis, Md. During the war, this company built 110-foot submarine chasers and harbor tugs for the Navy Department and tugs for the U. S. Shipping Board. Has a very complete plant for turning out steel or wooden yachts up to 200 feet in length and is now ready to build motor boats and yachts for private use either designed by the company or built according to the purchaser's private plans.

Clayton Boat & Shipbuilding Corp., Clayton, N. Y. Building fifteen 750-ton barges, 130x22x13 feet, for use on the Barge Canal.

Colcberg Motor Boat Co., Stockton, Me. Establishing plant. One 50-foot V-bottom speed boat.

College Point Boat Corp., College Point, N. Y. At present engaged in the building of six 110-foot submarine chasers, ten stevedore barges, eighty flying boats, as well as various canvas work contracts such as collision mats, bags, hammocks, canvas boat outfits, sails, etc. Have from 400 to 500 employees, and ample building and woodworking machine facilities to take care of anything a launching depth of 8 feet permits at present. Dredging is contemplated to increase capacity to 12 or 14 feet. In a position to handle yachts up to 125 feet, tugs to 100 feet and barges up to 1,200 tons.

Defoe Boat & Motor Wks., Bay City, Mich. Since the war this company has added to its wooden boat plant a steel shipyard, the site now consisting of fifteen acres on the Saginaw River at Bay City and with a water front of 1,700 feet all fully improved. The company is at present building eight steel mine planters for the War Department. These boats have steam power plants. It is still continuing its wooden boat work and knock-down boat work. It recently completed five torpedo chasers for the Navy Department and has no other Government work on in the wooden boat department at present.

Ditchburn Pleasure Boats, Ltd., Gravenhurst, Muskoka, Can. Plant located on the main line of the Grand Trunk Railway, on Muskoka Lakes, a pleasure resort district, about 100 miles north of Toronto and consists of a main woodworking shop, brick, steel and cement construction, steam heated, 120 x 60 feet, a steam-heating room 100 x 20 feet, and has an enclosed storage space of about 10,000 square feet. The company has been engaged, up to the present time, in the construction of pleasure boats, specializing in high grade runabouts from 25 feet to 45 feet with an occasional cruiser up to 80 feet in length.

Dubuque Boat & Boiler Wks., Dubuque, Iowa. Coast Guard cutters "No. 32" and "No. 34", 179x34x6 feet, 450 gross tons, speed 12½ miles. Six steel barges for use on the Mississippi River.

Dumphy Boat Mfg. Co., Eau Claire, Wis. Thirty-nine yawls, 24 feet long 3,500 pounds. Double-header 10 h.p. motors manufactured by the Gray Motor Co., Detroit.

Eastern Shipyard, Greenport, L. I., N. Y. One 88-foot tug for the Government.

The Elco Wks., Bayonne, N. J. This company was the first to undertake to design and build submarine chasers in 1915. During the last three and a half years, it has built more submarine chasers than all the rest of the world put together, 722 boats being the total. At the present time, it is finishing two contracts—one for the Royal Italian Government and one for the French Government. During the period it has also done a considerable amount of private work, consisting of 50-foot Elco cruisers, 36-foot Elco expresses, 32-foot cruisettes, etc. The restrictions of the war have, of course, hampered this private work, but now an early resumption of this business is looked for and it is hoped that with the company's greatly increased facilities, it can continue to serve the American public with Elco standardized motor boats of all sizes and types.

Henry Ford, Detroit, Mich. Building several score of fabricated steel ships 200 feet in length by 30 feet by 8 feet for the Government. Twelve fabricated steel submarine chasers, 200 x30x8 feet for the Italian Government. Establishing a plant near Newark, N. J., on the Lincoln Highway, for the construction of fabricated steel boats.

Gas Engine & Power Co., and Chas. L. Seabury & Co., Cons., Morris Heights, N. Y. Five steel vessels, 187 feet 10 inches by 35 feet 6 inches by 18 feet 8½ inches, for the Navy Department. Light ship for the Government.

Gibbs Gas Engine Co. of Florida, Jacksonville, Fla. Six boats for the Navy Department.

Great Lakes Boat Bldg. Corp., Milwaukee, Wis. At the present time are working to full capacity on special craft for the Navy Department, including 110-foot submarine chaser, 88-foot steam harbor tugs and smaller boats of the express cruiser type to be used by the Bureau of Aircraft Production. Shops and yards are best equipped to handle wooden construction in boats up to 150 feet in length. Yacht basin and electric marine railway have ample capacity to handle vessels of all sizes up to 100 tons. After the first of the year this company will be in production again on its regular lines of standardized express cruisers and will also be in position to handle special work of any kind, including pleasure yachts and commercial craft.

Greenport Basin & Construction Co., Greenport, L. I. One 88-foot tug for the Government.

Gulf Ship Building Co., Inc., Madison, La. Has finished this year sixteen barges for the U. S. Navy, one tug boat 140 feet long and one river steamer. Has adequate facilities for boat building consisting of completely equipped machine shop, blacksmith shop, electric plant with boring machines, four sets of repair way, two sets of building ways, woodworking plant and molding loft, two- and three-way ship saws, etc.

John L. Hacker Boat Co., Detroit, Mich. This company specializes in high-speed up-to-the-minute runabouts, and has built eleven high-class boats this season and has at present a special 28-foot boat which is being built for H. R. Duckwell, of Indianapolis and Miami, Fla. This will be shipped to Miami within a few weeks. Is in shape to build anything up to 60 feet in length but specializes in boats of the runabout type and builds boats as

standard propositions in sizes of 26-, 30- and 35-foot and special boats to order with guaranteed speeds up to 40 m.p.h., with available motors. Desires work outside of its standard sized boats in special boats of the runabout type but is prepared to build boats of the fast day cruiser type up to 60 feet in length. Standard boat carries guaranteed speeds of from 17 to 25 miles on the 26-foot, 30 miles on the 30-foot, and up to 37 and 32 to 37 on the 35-foot.

Hartman-Grieling Co., Green Bay, Wis. This yard purchased by the Northwest Engineering Works will be developed for wood and steel construction. One sea-going wooden tug, 150 x27x14 feet. J. Murray Watts, naval architect.

Hehre & Auer, Clason Point, Westchester, N. Y. Several motor boats for various interests.

C. Hilterbrandt D. D. Co., Rondout, N. Y. Seven coal barges. Four coal barges, 95x30x11 feet, 1,000 tons capacity. Five boats. Four 88-foot navy tugs.

Houston Bank & Trust Co., Houston, Tex. Taken over the plant of the Pan-American Trading Co. One concrete motor ship, 212x33 feet 6 inches by 21 feet 3 inches, draft 16 feet 8 inches, 1,500 tons capacity, 300 b.h.p. Diesel engines. One concrete motor ship, 1,600 tons d.w. capacity.

Robert Jacob Shipyard, City Island, N. Y. Several small wooden craft for various New York City interests. Twelve steel vessels, 500 tons d.w. Five 88-foot tugs for the Government.

Kyle & Purdy, Inc., City Island, N. Y. Plant greatly enlarged and now occupies practically an area of ten acres. Is equipped with new modern machinery and in a position to proceed with the building of motor boats and private yachts, according to individual needs. Company's marine railways are in full operation and has recently enlarged its departments in view of the urgent demand for motor boats and yachts after the war.

Luders Marine Construction Co., Stamford, Conn. With the cessation of hostilities in the European area, the Luders Marine Construction Company is already returning to a pre-war basis, and is bending every facility to take care of the large demand for yachts for next season's use, which is already beginning to appear. Very little has naturally been heard of the Luders Marine Construction Company during the war season, as it has been extremely busy on Government work of a confidential character. It has built a number of the 110-foot Submarine Chasers, and several of these boats have been selected to go to France, where they have stood up very well under the severe conditions of overseas service. The company has been busy on special steel barges for transporting airplanes; steam tug boats for the Navy, and it has just completed an order of a dozen 61-foot cabin launches for the War Department. This latter order worked in particularly well for the class of work that the Luders Marine Construction Company usually handles. This 61-footer was from a design of this company for use as a launch for service at the various forts, and the workmanship throughout was of such a character that it enabled this company to keep its regular men, who are particularly good at yacht work, right at these boats. This has been particularly valuable, inasmuch as the yacht building personnel has thereby remained intact, in fact, augmented, and it is now in a better position than ever for meeting the press of work that is beginning to appear.

Mann Shipbuilding Co., Baltimore, Md. Establishing a plant on Curtis Bay for construction of steel ships and has taken over the Mann Yacht Building Co.

Mathis Yacht Building Co., Camden, N. J. Five boats. Large number of hydroaeroplanes for the Navy Department. Two 88-foot tugs for the Government.

Matthews Boat Co., Port Clinton, O. During the last two years this company has completed twenty submarine chasers for the U. S. Government, seventy type HS-I-L airplane hulls and twenty-five type N-9, 18-foot training type pontoons. The total platted area of the plant is nine acres. The construction work is carried on in three buildings; two, size 55x200 feet and one, 110x120 feet. All three buildings have clearance height under trusses of 28 feet and all are provided with balconies or galleries for construction of smaller boats. The total floor area of all buildings which are lighted and heated is about 60,000 square feet. The machinery of the plant is operated entirely by electricity and includes complete modern equipment, joiner, and woodworking machinery of all descriptions; sawmill for heavy timbers, complete assortment of electrical drills, portable handsaws, portable shapers, planers and all other tools required in the construction of yachts. The company has specialized in boats up to a length of 125 feet and at present is limited to lengths not in excess of 140 feet. One marine railway is used for boats not exceeding a length of 60 feet and one electric lifting dock with a capacity of 100 tons is used for the larger boats. Its commercial work, barges, tugs and the heavier types of work boats are all built out of doors and are launched sideways into its own basin. Portable derricks and compressed air provides the conveniences for handling heavy work of this character. After the war the company expects to conduct its business much the same as formerly, building yachts on order, also it will have a line of standardized pleasure boats to offer in addition.

McCoy Bros., Daytona, Fla. One wooden fishing schooner, 106x28x14 feet, 150 gross tons, two four-cylinder Missouri oil engines, total 60 h.p., 7 knots, for the builder's account, starting 2 standard model Florida houseboats 100x21x3 feet.

Newcomb Shipbuilding & Dry Dock Corp., Hampton, Va. This company has built five submarine chasers for the U. S. Government and has now under contract four large cargo carrying boats, the first of which will be launched next month. Proposes to do general shipbuilding and repair work when the Government work is completed and may make a specialty of building the Newcomb life-boat.

Plant is located on Herbert's Creek, has marine railway, planing mill, sail makers' loft, sawmill, blacksmith shop, machine shop, metal workers' shop, store rooms, offices, restaurant, complete railway system through every part of the plant, traveling crane and derricks and labor saving devices generally.

New York Yacht, Launch & Engine Co., Morris Heights, N. Y. Ten motor boats for Navy Department. Five 88-foot tugs for the Government at an approximate cost of $99,800 each.

Niagara Motor Boat Co., North Tonawanda, N. Y. Has a large well-equipped plant of over 50,000 feet floor space and builds boats up to 60 feet in length. Specializes on runabouts such as are illustrated and described in its Bulletins No. 117, No. 217 and No. 317, furnished on request. Is also in a position to build life boats and heavy work boats and has done considerable work in this line in the past.

Frederick S. Nock, East Greenwich, R. I. U. S. Quarantine Steamer, Murray, 90x20x16 feet, 82 gross tons, being overhauled, new shoring on keel, new sheathing, propeller, etc. Enlarging plant.

Wm. R. Osborne's Sons, Croton-on-the-Hudson, N. Y. A number of 18-foot gigs for steamers building on the Great Lakes.

Richardson Boat Co., North Tonawanda, N. Y. This company has just started on a contract for five 64-foot tugs to be equipped with 110 h.p. Winton motors, for the War Department. These are regulation harbor tugs in every respect and will be used for towing purposes. At present, new pleasure boat orders are not being sought but the company will soon be able to take on anything in the pleasure boat line and small commercial boats. Has a well equipped factory, good launching facilities on the Barge Canal and there is an exceptionally good lumber market in the vicinity.

Rochester Boat Works, Rochester, N. Y. Thirteen distribution box-boats. 64x16x6 feet 6 inches, gas engines, 8 knots, 125 h.p.

Rocky River Dry Dock Co., Rocky River, O. Four 110-foot motor boats for the Navy Department.

South Jersey Yacht Bldg. Co., Atlantic City, N. J. Three sea-going tugs, 135 feet.

Ventnor Boat Works, Atlantic City, N. J. Has designed and built some of the fastest speed and semi-speed boats that hold world's records and is prepared to keep up the industry with the present plant. Has built many hydroaeroplane hulls of the latest types for war purposes, etc., and specializes in this line as well as the construction of pleasure boats up to 75 feet long of any type.

Howard E. Wheeler, Brooklyn, N. Y. Two 88-foot tugs for the Government.

Exporting—the Policy of the Future

(*Continued from page* 10)

that shipping is far from impossible, that there are vessels to transport our exports to all foreign markets and that some people know how to and do succeed in finding and employing them.

No one can deny that export shipping is an exceedingly difficult and complex problem nowadays. A hundred readers will probably rise up and cry, "You say it can be done—is being done, every day and every week—just tell us how!" The answer is: If your traffic manager or your export department doesn't know how, fails, then seek out the expert in ocean shipping who does know how, whose bread and butter depend on knowing how. Too many manufacturers fancy that all they have to do, all they can do, is to write letters to established steamship lines begging for freight room. Of course they don't get it. No ocean cargo space is going begging today. These manufacturers forget that a ship which for years has been plying back and forth between New York and Havana may suddenly be diverted by Government order to a voyage to South Africa, that special boats are all of the time being allocated under various managements to sundry trades, that all shippers have frequently to employ sailing vessels. They forget that the greatest of all influences in getting export goods actually on board any ocean carrier in these days is the personal element, the intimate acquaintanc with shipping managers, agents, brokers bill of lading and dock clerks. As a prominent New York export merchant expressed it to me the other day, he had to "kiss the captain" to get his goods on board a boat for Brazil. If the manufacturer has not this intimate, personal acquaintance, both with the varied ways and means that offer and with the right officials then let him seek it out and find it in the ranks of foreign freight forwarders and freight brokers who do have it, or ought to have it. And remember that if one hasn't another may have. Now, of all times, is the last for manufacturers to "lie down on the job."

Who is ready to confess that he is not the equal of his neighbor and competitor in intelligence, ability, resourcefulness?

Now is the last of all times to "lie down on the job" because the future of your trade, of the Nation's trade, chiefly depends on your disposition today. And it is for the future, not for the day, that we must work. The marine motor maker, who fancies that he can leave without attention his established agents, distributors and dealers, is likely to fall down with a dull, sickening thud when bye and bye he seeks the easier, "After-the-war" trade. He can not leave his customers stranded high and dry without stocks, without enlightenment and encouragement. He has got to exhaust his every resource in shipping when he can, in any event in frequent, friendly, diplomatic correspondence.

No manufacturer or exporter can wait the return of days of normal trade and shipping, if he wants his share in the rich trade of the world which will soon be flowing in a great tide towards the United States of America. That trade will not come to the unknown manufacturer. It will come to him who has made his name and his products known, to him who has handled his old connections with intelligence and fairness, who has done his best to cater to them, who has impressed new agents and customers with the merits of his wares and with his desires and his ability to work in close harmony with them, who has (when in any way possible) put actual samples of his products in the hands of new agents, who has strained every nerve to supply something in the way of stock to old customers. The time to work for export expansion is not next year; it is today.

The markets of the world are today virtually bare of supplies in many lines. In some of them, we know, there are no marine motors to be had. Demands will grow pressing as the world becomes satisfied that an era of peace has actually returned. New enterprises will be undertaken, enterprises long postponed will be taken up again. It will be to the United States that orders will come, because in an industrial way we shall be for a long time the only community in position to supply, with at least comparative promptness, and because we only have immediately available supplies of raw materials. Who among us will get these orders? Who, if not those who have taken time by the forelock, who have wisely acted during difficult days and wisely planned? Constructive thought and work are demanded, no mere abstract theorizing.

As a Nation we ought by this time to be thoroughly awakened to international thought and deeds. Quite as essential to our National well-being as our study of individual problems in world-wide trade expansion is the interest we each personally must devote to some serious National policies. Our Congress largely determines them for us. Representatives and Senators may be, should be, influenced in adopting business policies by the business thought in the communities which they represent at Washington. Hitherto our manufacturers and business men too often have seemingly contemplated their duty as done with the passing of formal, unimpressive resolutions by their chambers of commerce. Without the creation of a strong, living and active public sentiment, no member of Congress will be moved to vote one way or the other. It is distinctly up to the manufacturer and business man to fan the fires of public sentiment in his own bailiwick, to ensure that his friends, his neighbors, all his fellow citizens, understand aright these questions of National policy which day by day are developing more and more seriously and critically. Above all is this essential in those states and districts whose representatives in the Congress are known to look on some public questions from quite other than the business man's point of view. On these senators and representatives mere resolutions of chambers of commerce make little impress. The preponderance of voters' sentiments may. Hence it follows that the manufacturer must turn politician as he realizes the gravity of some of the problems which confront us.

As affecting our export trade these are several of these problems. Quite as critical are they for us as those, perhaps more obvious ones, which confront us in our purely domestic organization of the future. For example, what about this great American Merchant Marine which we are creating so fast? For two or three generations we have wailed over its absence; orators galore have declaimed passionately on our backwardness; we have had thousands of solemn warnings of the dire effects of the lack of American ships on American export and import trade and finance. Now we've got the ships—what are we going to do with them? Shall we keep them, and how? Shall American ship owners be placed on a parity with their competitors, the ship owners of other countries? Shall the Congress still be permitted to pass laws that kill when they should encourage? What, if any, Government support and encouragement may properly be offered?

Our own tariff and international tariff agreements in the post-war era demand the thought and study of every exporter. Are we today a member of the great family of nations, or are we an isolated community? Is the tariff a local issue, or is it a weapon or tool of tremendous importance in the expansion of our influence and our world trade, both export and import?

There is the question of our Consular Service and the activities of the Bureau of Foreign and Domestic Commerce. Both have helped our foreign trade expansion, both can in the future do a great deal more. Congress has always shown itself particularly niggardly in its appropriations for both, especially for the former. Year after year, before the war, the Chief of the Consular Service presented his budget and saw what he regarded as indispensable appropriations cut down to one-third of his demands. We need more consuls and better paid consuls and vice-consuls, more and better paid commercial attachés. Manufacturers, exporters, business men of all classes can help to get them.

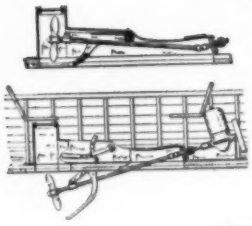
What about commercial education? We have magnificent trade and technical schools and a good many of them. Why have we no thoroughly good commercial schools especially devoted to training for foreign trade? Why is the teaching of elementary geography so poor, why no real courses in practical commercial geography, why such wretchedly inadequate training in foreign languages as they are spoken? Why do not chambers of commerce or

(*Continued on page* 84)

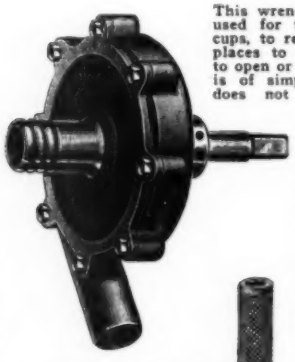
New Things for Motor Boatmen

Each month new parts, attachments, and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descriptions and publish only illustrations with short explanatory captions. In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the name and address of the manufacturers from whom the products may be obtained.

A compass that makes night sailing a pleasure. The light for this compass is furnished by an electric bulb at the bottom of the compass bowl and is reflected from the removable cover down onto the compass card. This effectively prevents any direct rays of light leaving the compass bowl and avoids eye strain. For day sailing the cover is removed and the compass used in the ordinary way

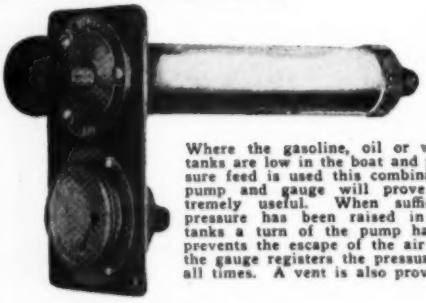


Here is a light, double-ended, power-driven skiff that is seaworthy, yet can run in shallow water or even be pulled up on the bank. The shaft and propeller are so arranged that they may be raised up within the hull of the boat, leaving nothing projecting below the keel. The speed of the boat may be controlled by regulating the depth of the propeller, but at all times the wheel is protected



This wrench is intended to be used for tightening up grease cups, to reach into inaccessible places to open drain cocks or to open or close relief cocks. It is of simple construction and does not require adjustment

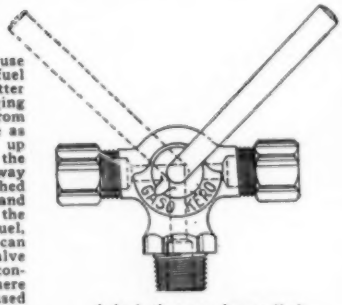
Here is a spark plug which, it is claimed, will not accumulate carbon even when used in a motor burning kerosene. The theory on which these plugs are designed is that the edges of the ridges in the porcelain will be heated to a sufficiently high temperature to burn away any carbon which might accumulate on it and tend to short circuit the plug



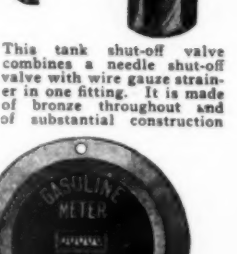
Where the gasoline, oil or water tanks are low in the boat and pressure feed is used this combination pump and gauge will prove extremely useful. When sufficient pressure has been raised in the tanks a turn of the pump handle prevents the escape of the air and the gauge registers the pressure at all times. A vent is also provided

A well-made centrifugal pump that may be used either as a circulating pump or bilge pump. They are made of bronze throughout and with either hose or standard pipe connections

The temperature at which a motor operates directly effects its economical use of fuel. This thermostatic valve is placed in the water outlet line and will by-pass some of the water into the supply line until the proper temperature in the water jackets is reached



With the increasing use of kerosene as a fuel in marine motors better devices for changing the fuel supply from gasoline to kerosene as the motor warms up are being put on the market. This three-way valve can be attached to the carbureter, and a 90 degree turn of the handle changes the fuel, or both fuel lines can be shut off. This valve will also serve to control the fuel where two tanks are used



This tank shut-off valve combines a needle shut-off valve with wire gauze strainer in one fitting. It is made of bronze throughout and of substantial construction

A lock that can be applied to any steering column and absolutely prevent the use of a motor boat without the owner's consent. It is made in various sizes to fit standard steering gears

This gasoline meter registers in gallons and tenths the actual amount of gasoline that is fed to the carbureter. It is intended for use with the Stewart vacuum system of gasoline supply

Large air ports are now a stock article. These air ports are made in several sizes from designs adapted by the Emergency Fleet Corporation for use on wooden ships of the Ferris type

Do not fail to write to the editor if you desire information concerning any of the above new things

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

An Extremely Sensitive Thermostatic Metal

The development of the G.E. thermostatic metal by the General Electric Company has put a new means for warning of undue heat or cold and prompt regulation of the temperature changes into the hands of naval architects, naval constructors, and navigators.

This metal is so susceptible to temperature changes that a difference of one degree higher or lower will tend to curve or straighten it and always to the same extent. It can be used for temperatures as high as 500 degrees Fahr. By curvature or straightening it will make and break electrical contacts and even exert a force.

Its present use as a means of temperature regulation in furnaces and refrigerators together with its non-corrosive characteristics suggest its possibilities in marine service.

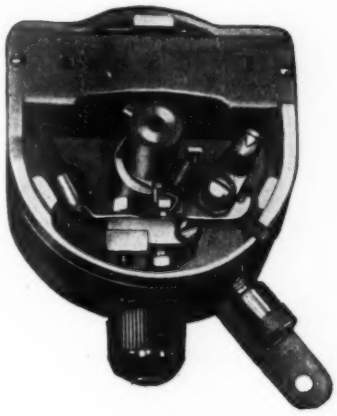
As a result of its responsiveness to change of temperature and the mechanical force developed, this metal is used to actuate various mechanisms which tend to neutralize either the temperature change or its effect upon various devices.

G.E. thermostatic metal consists of two strong non-corrosive metals possessing a wide difference in coefficients of expansion, the widest difference possible for any known stable combination of metals. These two metals are firmly attached to each other throughout their entire length so that there is absolutely no slip of the one upon the other. Thermostatic metal can be cut, stamped or pressed into practically any shape, and when annealed will have all its original inherent qualities; moreover, it will not deteriorate nor take permanent set under applications of heat or force within definite practical limits. The metal is manufactured in various standard thicknesses ranging from 0.25 to 0.015 inches, maximum width of 6 inches and maximum length of 36 inches.

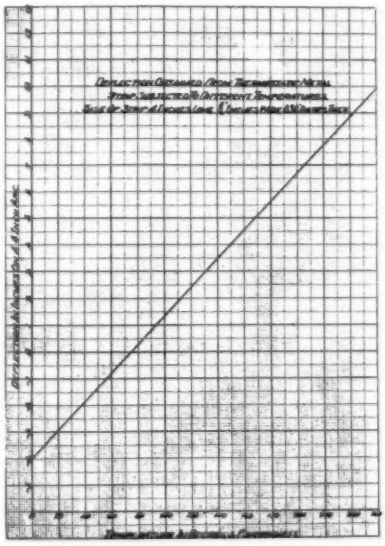
The deflection per degree temperature changes besides being considerable as shown by the curve, is a constant for any definite piece of the metal.

G.E. thermostatic metal is used in the products of many different industries owing to the fact that it can be successfully worked into different shapes and forms. In some of its applications it is used to actuate mechanisms directly by means of the force developed within itself when its tendency toward assuming a curved shape is restrained. In other applications it is used to close and open the contacts of electrical circuits by means of which various devices are operated. Besides the previously mentioned possibilities in carbureter manufacture, for automatically controlling the richness of the mixture as the temperature changes, it could be used in scales, balances, and other scientific instruments in compensating for errors due to temperature changes. It is used in furnaces, incubators, and refrigerators for controlling the temperature.

The reliability of this metal has merited its use in thermometers and has gained consideration for it as a compensating device in watch balances, and it is but a step forward to see it used in the proverbially accurate ship's chronometer.



Breaker box of Phillips-Brinton ignition system with cover removed to show simplicity and strength of the parts



Curve plotted to show the constant rate of deflection per degree temperature change obtained with G. E. thermostatic metal

Limousine runabout, Sanatorio de Pedrosa, designed and built by A. Conde at La Coruna, Spain, and powered with a 17-25 h.p. model E Sterling motor

Devoe & Raynolds Co., Inc., Reorganize

The recent deaths of Charles G. Barrett, president, and George A. Meyer, treasurer, of the Devoe & Raynolds Co., Inc., brought forcibly before those who were devoting themselves exclusively to the interest of the company the fact that the common stock of the company was largely held by persons not actively engaged in the business.

This being a most undesirable position from the viewpoint of efficiency in organization and prosperity for the stockholders, William H. Phillips, of New York, and John J. Alsfasser, of Chicago, determined to remedy this condition. They organized a company known as the Devoe & Raynolds Syndicate Corporation, incorporated under the laws of the State of New York, and succeeded in purchasing from the inactive stockholders a considerable portion of the common stock held by these interests in the company. The officers of the Devoe & Raynolds Syndicate Corporation are: William H. Phillips, of New York, president; S. H. Harrington, of Chicago, vice president; John J. Alsfasser, of Chicago, treasurer; S. Stanwood Menken, of New York, secretary; and the control of the affairs of the company remain in the hands of those who have made it their life work and are still interested in the development and the progress of the institution. These gentlemen also appreciated that business of today is transacted successfully along broad lines and realized they, individually, could not be successful without the earnest cooperation of the heads of the departments and the employees who had also devoted their lives to the interest of the company, and therefore resolved to inaugurate a cooperative plan among their valued employees which would enable them to participate in any dividend made by the company and thereby secure their best efforts for the advancement of the stockholders.

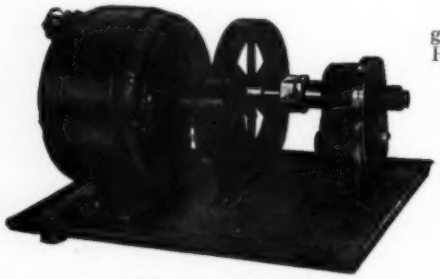
The Devoe & Raynolds Syndicate Corporation have offered to the employees of the Devoe & Raynolds Company an opportunity to purchase stock as they can successfully assume at the same price which the syndicate paid the inactive stockholders, and the employees need not pay cash for this stock unless they desire to do so.

The stock is to be sold to them with six years' time in which to pay for it with the understanding that all dividends on the stock be applied to the payment of interest and principal and as soon as an employee has accumulated sufficient to take up any of the stock set aside for him it will be transferred to him individually.

Another Old Company Reorganizes

The Dayton Electrical Mfg. Company has been reorganized with H. G. Catrow as president; Vincent G. Apple, vice-president and general manager, and William V. Knoll, secretary and treasurer.

This company was the originator of the low voltage dynamo floating storage battery system for ignition and lighting for motor boats and automobiles, and its product for a great many years has been the standard for



A typical electric pumping unit as manufactured by the M. L. Oberdorfer Brass Co.

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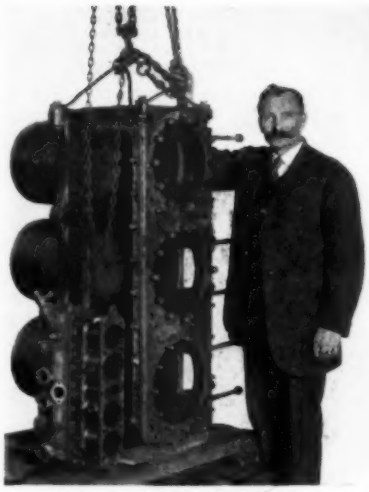
International Life Suit Corporation Changes Name

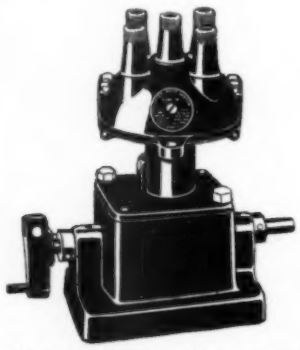
The International Life Suit Corporation, formerly the selling company for the Ever-Warm Safety-Suit, has been taken over by the National Life Preserver Company, the parent company, owners of all the patents and now sole owners, manufacturers and distributors of the Ever-Warm Safety-Suit.

The offices remain unchanged, Suit 1031, 11 Broadway, New York City. The officers of the National Life Preserver Company are: W. N. Hanson, president; O. A. Youngren, vice-president and general manager (also the inventor); and James A. Watt, secretary.

Demonstrations of the Ever-Warm Safety-Suit in the water are given in the basin at Pier A, Battery Park, near the Aquarium, every Wednesday afternoon at 2 o'clock. Prospective voyagers, naval and army officers, boat owners, navigators and seamen are drawn to witness these demonstrations for repeated proof of the success of this great life saving suit.



Mr. Lawrence, the inventor of the Lawrence process of repairing scored cylinders with typical examples of the work they are prepared to handle



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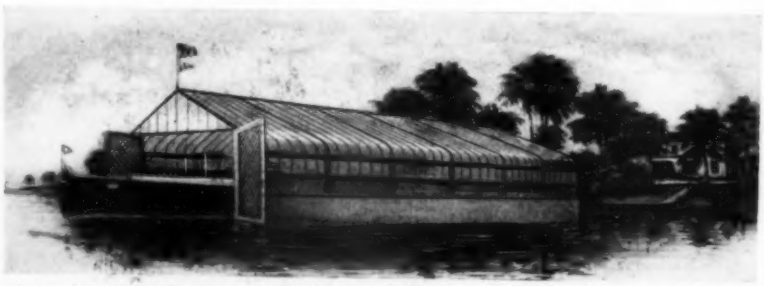

A novelty in boat houses. A glass house similar to a green-house built on a concrete foundation at the winter home of L. M. Rumsey at Alton Beach, Miami, Fla.

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Victory

(*Continued from page 7*)

with development in motor boating and yachting. One is impossible without the other.

With the coming back into civil life of thousands and thousands of young men now in the Navy and Naval Reserve, a new era is to be born of recreational life upon the water. These thousands, a majority of whom had never before tasted of salt water, have now been trained in a love of the sea which they never will forget. It has become a passion that cannot be overcome. There can be but one result. They will become yachtsmen and boat owners. A season hence those who are prepared will reap the reward.

But is the industry of manufacturing and selling boats, engines and their accessories, prepared for what is before them? At the present writing most of them are not. The time is short before all of this will happen. Uncle Sam moves quickly. Tomorrow may see these thousands of young men ready and headed for the salesrooms. The studying of catalogues has already begun. Advice is already being sought of those who have had experience afloat with motor boats.

There is no doubt but that developments in engines and boats which are sure to come are going to be along sane and rational lines. Of course we shall always have freaks and impractical outfits but they will be few in number, short-lived and the proportion of these to the real boats which are to come will be so insignificant that the freaks will sink into oblivion.

The real secret of the success of industry is to be the development and production of craft which will endure from year to year with a minimum of care and upkeep. Comforts and convenience should be the ideals whether it be in the small open boat, the mammouth motor cruiser or any of the thousands of possibilities in between. This does not mean in any sense the sacrificing of speed and seaworthiness as these are factors of comfort and conveniences which are as vital as the reliability of the power plant itself and cannot be overlooked. In fact, there are so much vital factors which go into the composition of a sane boat that there is a chance for many master minds to give much thought to the subject before the ideal is reached.

In the past, have had the express cruiser which at one time promised to be very popular but this dream blew up in a puff of smoke. There was a reason and the reason was simply this; about 99 per cent. of the thought and effort was directed toward obtaining extreme speed. The result was as one would naturally expect—generally failure either at the beginning or after a few trips out in the open. On the other hand we had the other extreme, the type of boat generally referred to as the "tub," the relic of ages past, on which everything was unreliable and out of date. Such an outfit did as much to disgust the general public with boat-

(*Continued from page 60*)

110-Ft. Yacht "CONSUELO"
Sixteen Years' Designing Experience
Specialty Seagoing Yachts
J. MURRAY WATTS, N. A.
328 Chestnut St. Philadelphia

BRUNS, KIMBALL & CO., Inc.
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Offer over 200 re-built engines, backed by a strict guarantee, at especially attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Gray-Prior, Doman, Missouri, Universal, 4 cycle; Eagle, Hartford and Arrow, 2 cycle; Missouri heavy oil engines, simple and economical. Burnoil, heavy duty 4 cycle heavy oil engines, quick starting, economical, easy to operate. Write for offer.

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Waterproof Spar Varnish
For all OUTSIDE AND INSIDE work. Defies Salt Water. Guaranteed.
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USN DECK PAINT
for porches, floors and walls DRIES HARD OVERNIGHT
Just the paint for your boat. Durable, lasting, economical. Does not soften under heat. Write us if your dealer hasn't it.
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1167 E. 40th Street, Cleveland, Ohio
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BULL-DOG REVERSE GEAR
"The Gear that Hangs on"
Smaller, simpler, lighter, more compact and more accessible than any other gear of its capacity. Enclosed and oil-tight.
4 Sizes—1 to 64 H.P. per 100 R.P.M.
Satisfaction Guaranteed or Money Refunded.
ATLAS MACHINE WORKS
Successors to Kennedy Machine Co.,
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GASOLENE ENGINES
4 to 400 H. P.
Heavy Duty and High Speed
Noted for Reliability
MURRAY & TREGURTHA CO.
South Boston, Mass.

40 H. P. VALVE IN HEAD
Knox VALVE IN HEAD
$1300
COMPLETE WITH ELECTRIC STARTER AND REVERSE GEAR
KNOX MOTORS ASSOCIATES, Springfield, Mass.

KEYLESS RADIUM DIAL CLOCKS
The ideal clock for every motor boat, cruiser and yacht. The Radium Dial makes the hands and numerals visible at night.
Adopted by the U. S. Navy for Airplanes.
Price $15.00. Other clocks from $2.50 to $6.00.
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Keyless Auto Clock Co., 246 West 59th St., New York City.

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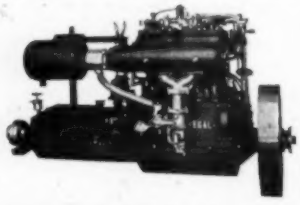
ARE GOOD ENGINES
ASK ANY USER
Anderson Engine Co., 4032 N. Rockwell St., Chicago.
New York Office, N. W. Cor. Broome & Lafayette Sts.

FISHING BOATS
require serviceable engines



REGAL
Four-cycle Gasoline and Kerosene
engines have been on the market for seventeen years. Let us tell you about them. 2 H.P. to 50 H.P., one to four cylinder.
Regal Gasoline Engine Co.
74 W. Pearl Street Coldwater, Mich.

ELECTRICAL HEATING AND COOKING DEVICES for Motor Yachts
Motor Yacht Builders
Flat Irons, Toasters, Grills, Toaster Stoves, Curling Iron, Heaters, Soldering Irons, Air Heaters, Glue Pots, Etc.
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Write for Illustrated List, Prices and Descriptions. Oldest and Largest Exclusive Makers. Estab'd 1884.

LYKNU POLISH
WILL MAKE YOUR BOAT JUST LIKE NEW

POLARINE
The Standard Oil For All Motors
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BATTERY CHARGING
Give longer life to storage batteries.
Three Sizes: for clubs and private boathouses.
General Electric Co.
Schenectady, N. Y.
35A-2

Wittemann-Lewis Aircraft Company
Flying Boats & Airplanes
Newark, New Jersey

The Navy's Job Is Just Half Done!

EVERY soldier who sailed for France was given a round-trip ticket. The Navy took them over and now the Navy must bring them back. There can be no relaxation of effort until the job is done, until every one of our boys is returned to his home. To complete this task the Navy needs more men, and the need is just as urgent now as it was before the armistice was signed. This condition offers you an opportunity to be identified with the Great War, your *last chance*.

The cancellation of the November draft call has deprived thousands of men of the privilege of participating in the war, but the Navy's call for men enables you to volunteer your services. If you can qualify for any of the vacancies now existing, you may be inducted into the service at once.

Men are needed now, if not to fight, then for services equally essential to the re-establishment of normal conditions. The Bureau of Navigation has issued a call for several hundred men who can qualify for posts which require specialized ability. Only those who are registrants of September 12, 1918, or registrants of deferred classifications of previous registrations are eligible. Applications will now be received for training in the Deck Officers' School of the Naval Auxiliary Reserve. Applications for induction in this branch of the service must possess an education equivalent to a high-school course, including a good knowledge of trigonometry and logarithms. The age limit is twenty-one to forty years, inclusive.

Further information and full particulars will be furnished upon application at the U. S. Navy Mobilization Station, in the Transportation Bldg., Chicago, Ill. Mail should be addressed to Lieut. H. D. Childs (Ret'd), Commanding Officer.

Motor Boats That Won the War

(*Continued from page 13*)

cruise at the present writing. Starting from forward is the forepeak, then the crews head and quarters, with twelve berths. This compartment contains mess gear and small hot water boiler which heats the ship. Next is the forward ammunition room, opening into the officers' quarters, in which are two staterooms, toilet with shower bath, and radio room. This compartment has a gas-tight flat, under which are stowed the fuel tanks of heavy galvanized steel, total capacity 2,400 gallons. Next is the engine-room with the three main engines and auxiliary pumping, air-compressing and lighting engine; batteries, air tanks, work bench, etc. Then the after ammunition roof, aft of which is the petty-officers' stateroom, officers' mess room, galley and lazarette. Good ventilation for below, when hatches are battened down, is provided by electrically driven blowers.

The proof of the pudding is in the eating. The "S. Cs" were conceived and built in a hurry. The French Ad-

(*Continued on page 60*)

Baldridge
Reverse Gear
has every good feature that any other good reverse gear has—and then some.
The BALDRIDGE is a clean gear. Its perfect enclosure keeps all grease in the gear where it belongs.
THE BALDRIDGE will work for you a long, long time. Salt water cannot get in and rust out its parts.
THE BALDRIDGE unbroken mainshaft absolutely prevents your gear from sagging and getting out of alignment.
Immediate deliveries are now possible if you act quick.
Send for booklet, "For the Man in the Boat"—Free.
The Baldridge Gear Co.
Boston, Mass.
The reverse speed is 66⅔% of the forward speed.

WHITING-ADAMS
That name is all you need to know about the brush. It guarantees highest quality; longest wear, lowest price.
JOHN L. WHITING-J. J. ADAMS CO.
Boston, U. S. A.
Brush Manufacturers for Over 100 Years

Euclydes de Souza Lima
Agent for engines and various kinds of machinery.
P. O. Box 254
MANAOS, AMAZONAS
North Brazil South America

PUMPS
Made by the
Lipman Mfg. Co.
for circulating purposes are the very best. Hundreds of Thousands in use. Send for Catalogue.
233 Pleasant St. Beloit, Wis.

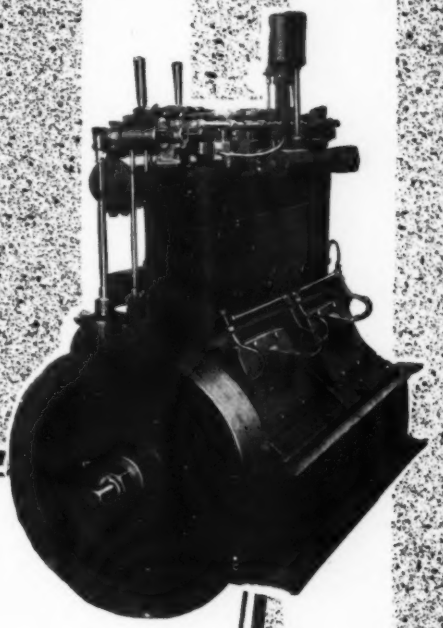
"BEAUTIFUL BOATS
and How to Care for Them"
A book about boats, with beautiful water colors by Felicie Waldo Howell, and methods for keeping all kinds of craft seaworthy. It is Free to those who write for it.
MURPHY VARNISH COMPANY
NEWARK CHICAGO

Sootless
The Aristocrat of Spark Plugs
THE BRASS PLUG $1.25
DAMPNESS AND SPRAY PROOF
The Brass shell won't rust into cylinder head
OAKES & DOW, 40 Chardon Street, Boston
NO PORCELAIN TO BREAK

Quayle

Oil-Burning Marine Engines

(Hvid Type)



The Quayle Oil Burning Marine Engine is specially adapted to use in cruisers, power boats, launches, fishing boats, freight boats and other small commercial craft. It possesses every advantage of the gasoline burning power plant with none of its disadvantages. It starts easily, operates smoothly and gets every ounce of power from the fuel—there is no waste or inefficiency. The Quayle will burn any of the heavier free flowing oils including kerosene, polar oil, vegetable oil, fuel oil or fish oil—it will not operate on gasoline. It produces maximum power under any conditions and will pay for itself in 300 days by the saving in fuel costs. It will take you twice as far on six cent fuel as the high priced gasoline. It's simple in operation and construction—there are no complicated parts to get out of order or confuse you. The Quayle has no carburetor, magneto, batteries, spark plugs, ignition points, make and break ignitor, coils, timer, wires, switches, hot torch, tubes, plates, fuel pump or high duty compressor. It's built for work all day, every day.

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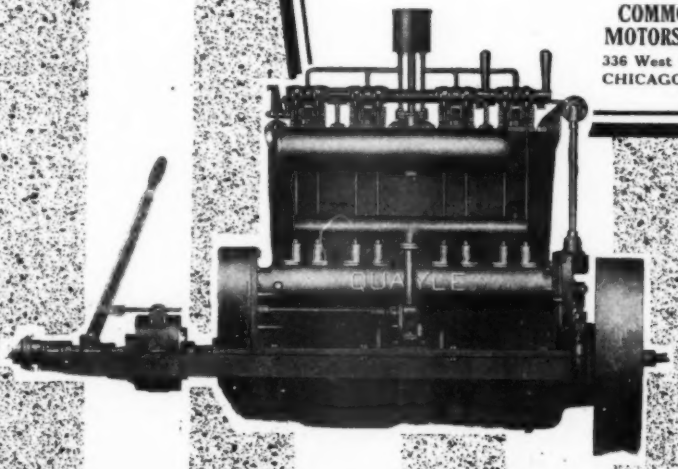
336 West Madison St.
CHICAGO, ILLINOIS



For Heavy Duty Work

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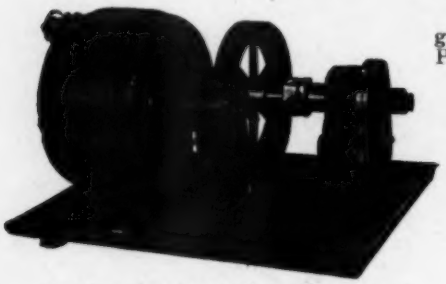

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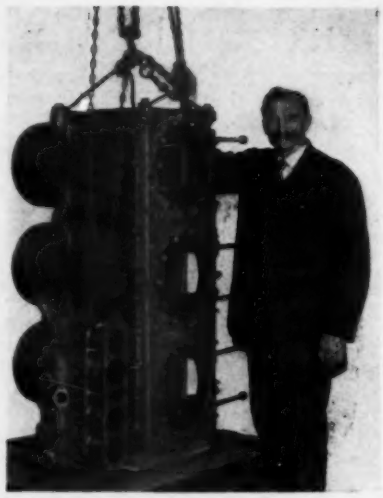

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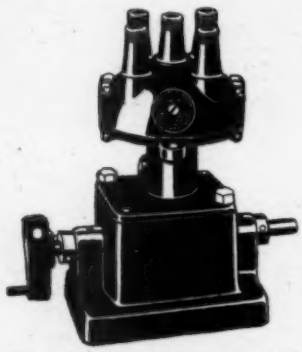

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VALENTINE'S VALSPAR

The Varnish That Won't Turn White

MISS CONSISTENCY II.
Owned by Com. M. J. Sullivan, of Brooklyn, N. Y. Built by Hubert S. Johnson, of Bay Head, N. J. Has a Wisconsin Consistent Motor and a speed of 30 miles an hour. Selected mahogany and Valspar Varnish used throughout.

MISS CONSISTENCY II —saucy and trim, and geared up to a 30-mile clip—is Valsparred, of course!

We say *"of course"* on the best of authority, because along with her picture came this emphatic statement by Mr. T. M. Fenner of the Wisconsin Motor Mfg. Company:

> "We have used Valspar for varnishing these standardized run-abouts for the past five years, and as we have tried all others, *we have found none that would take its place.*"

There you have it! *There is no varnish that can take the place of Valspar*—and the builders and owners of thousands of speed-craft and yachts and boats of all kinds *know* it.

Valspar dries dust-free in two-hours and hard overnight. It is water-proof and won't turn white. It retains its brilliance without spotting, cracking or blistering.

Valspar is sold by paint, hardware and marine supply stores everywhere.

A copy of our useful little booklet, "How to use Valspar on Boats," will be sent you free on request.

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456 Fourth Avenue, New York

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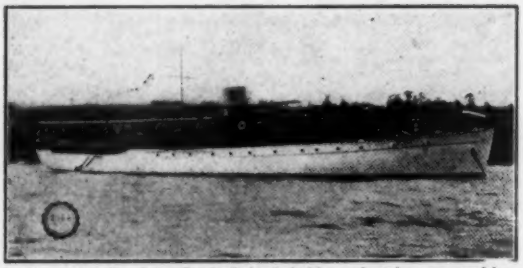
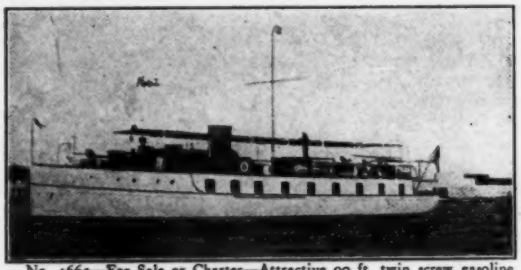
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.

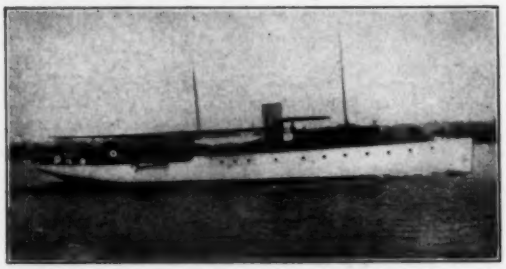


No. 2366—For Sale—Particularly desirable steel, twin screw cruising power yacht; 126 x 18.6 x 6 ft. Recently built in best manner; exceptionally able craft. Speed 12-14 miles; two 125-150 H. P. 6 cyl. air-starting motors. Large deck dining saloon; main saloon, five staterooms, two bathrooms, etc., aft. All conveniences. Handsomely furnished. Cox & Stevens, 15 William St., New York.



No. 1662—For Sale or Charter—Attractive 90 ft. twin screw gasoline houseboat; speed 10-12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William St., New York.

No. 148—For Sale—Steel, flush deck, steam auxiliary schooner yacht; 130 ft. overall. 110 ft. waterline, 26 ft. beam, 15.6 ft. draft. Speed under power 9 knots; compound engine; electric lights; all conveniences. Extremely able craft; heavily constructed. Cox & Stevens, 15 William St., New York.



No. 2030—For Sale or Charter—Modern, very roomy, twin screw power yacht, 124 x 18.6 x 6 ft. (Now has after deckhouse.) Very economical to operate. Large dining saloon and social hall on deck; main saloon, six staterooms, two bathrooms and three toilets aft. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.

No. 1706—For Sale or Charter—Very roomy, twin screw cruising power yacht, 99 x 17 x 4 ft., adapted for Florida service. Speed 12-14 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms; all conveniences. Cox & Stevens, 15 William Street, New York.

No. 3233—For Sale or Charter—Particularly desirable 123 ft. steel yacht. Speed up to 17 miles. Recent build. Dining saloon and social hall on deck; five staterooms, two bathrooms, etc. Cox & Stevens, 15 William Street, New York.

No. 3151—For Sale or Charter—Modern, twin screw gasoline houseboat; 75 ft. x 17 ft. x 2 ft. 6 in. Speed 10-12 miles. Large deck saloon; four staterooms, two bathrooms, dining saloon; all conveniences. Special opportunity. Cox & Stevens, 15 William St., New York.

No. 1674—For Sale—Attractive 85 ft. modern power yacht. Speed 13-15 miles. Excellent accommodation. Splendid opportunity to secure high grade craft at extremely low figure. Cox & Stevens, 15 William Street, New York.

No. 3539—For Sale—Fast, up-to-date 60 ft. bridge deck cruiser. Speed 18 miles; 8 cylinder Van Blerck motor (new 1917). Double stateroom, saloon, large galley, etc. Cox & Stevens, 15 William St., New York.

No. 3035—For Sale—Fast and very roomy bridge deck cruiser; 47 x 10 x 3 ft. Speed 16 miles; 100 H. P. 6 cyl. 4 cycle motor. Separate galley, saloon and single stateroom forward, besides double stateroom and toilet room aft. Electric lights. First class condition. Cox & Stevens, 15 William St., New York.

No. 2580—For Sale—Light draft, Lawley built, 68 ft. twin screw power yacht. Speed 11-13 miles. Enclosed deck house with dining saloon below forward; two double staterooms aft. Practically in commission. Cox & Stevens, 15 William Street, New York.

No. 3541—For Sale or Charter—Particularly desirable 100 ft. steel twin screw cruising power yacht. Very attractively finished and furnished. Speed up to 15 miles; two 6 cyl. air-starting and reversible Standard motors. Fitted with every convenience. Large dining saloon and social hall on deck; five staterooms, bath, two toilet rooms, etc. Cox & Stevens, 15 William Street, New York.

No. 1378—For Sale—Bridge deck cruiser; 40 x 9 x 3.6 ft. Speed 11 miles. Double stateroom aft. Saloon and galley forward. Equipped with 6 cyl. 40 H. P. motor located under bridge deck, absolutely shut off from forward and after cabins. Price exceptionally low. Cox & Stevens, 15 William St., New York.

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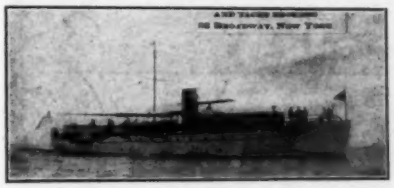
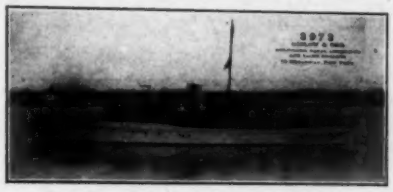
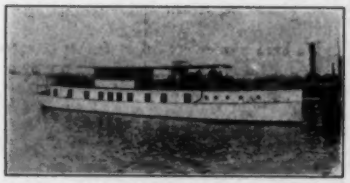
We have a most complete and up-to-date list of power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request. FOR SOUTHERN CRUISING this winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters.



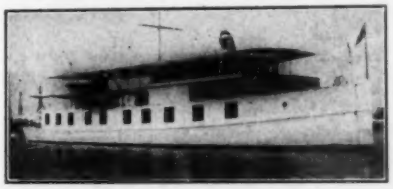
No. 4591—For Sale—Handsome steel twin screw gasoline cruiser 126 ft. length, 18 ft. 6 in. beam. Speed eleven miles. Modern construction, wonderful sea boat. Five staterooms, large deck saloon. Heated throughout. Equipped with Sperry stabilizer. Unquestionably finest yacht available. Located Great Lakes. Gielow & Orr, 52 Broadway, New York City.



No. 3973—For Sale—Handsome 82 ft. twin screw motor boat with 14 ft. 6 in. beam and 2 ft. 10 in. draft. Tunnel stern. Built especially for shoal waters. Two double staterooms, very large deck saloon, mahogany finish. Equipped Sterling engines. Speed ten knots. Complete throughout. Splendid condition. Price reasonable. Gielow & Orr, 52 Broadway, New York City.



4266—For Sale—Desirable 95 ft. twin screw house boat: beam 19 ft., draft 3 ft. 3 in. Two Sterling engines new 1917. Speed 10 miles. Accommodations afford four double staterooms and main saloon below deck. Large deck sun parlor. Yacht fully equipped, in commission. Gielow & Orr, 52 Broadway, New York City.

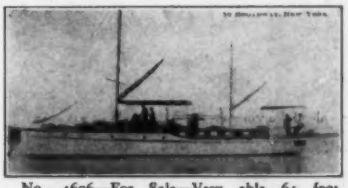


No. 5565—Sale—Charter—Modern 85 ft. motor house boat. Draft 30 in., built 1916 for Florida cruising. Standard motor. Speed 9 miles. Two double; two single staterooms, all modern plumbing and fittings. Most desirable boat for Florida available. Can be chartered, and for sale at bargain price. Inspectable Florida. Gielow & Orr, 52 Broadway, New York City.

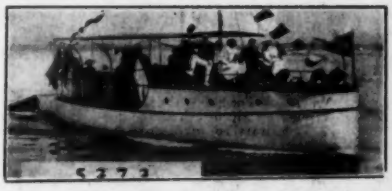
No. 3957—For Sale or Charter—Attractive 75 ft. cruiser, beam 13 ft., draft 3 ft. 6 in. Standard engine, speed 10 knots. One double two single staterooms. Accommodate five persons. Electric lights, hot water heat. Bargain. Gielow & Orr, 52 Broadway, New York City.

No. 3987—Sale—Charter—Up-to-date modern 85 ft. Florida cruising houseboat. Four large staterooms. Standard motor. Speed ten miles, draft 30 in. Hot and cold water, electric lights. Inspectable Florida. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

No. 5951—For Sale—40 ft. Hand express cruiser. New 1917. Van Blerck motor. Speed 20 miles. Best construction. Able sea boat. Fully equipped. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

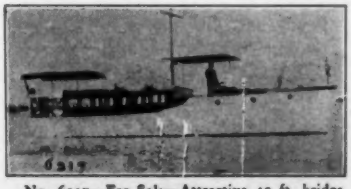


No. 4606—For Sale—Very able 64 foot cruiser, 12 ft. 6 in. beam, 4 ft. draft. 6 cyl., Heavy Duty motor new last year. Speed 10 knots. One double one single stateroom opposite main saloon. Accommodate five persons. Boat heavily built, especially for offshore cruising. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

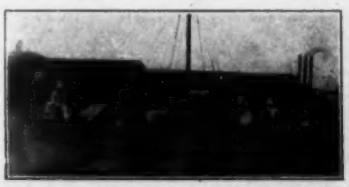


No. 5272—For Sale—50 ft. bridge deck cruiser in commission. Sleeps six people. 4 cyl. 4 cyc. motor. Speed 11 miles. Price low. Gielow & Orr, 52 Broadway, New York City.

No. 6233—For Sale or Charter—Mathis house boat 43 ft. in length, 13 ft. 6 in. beam, 32 in. draft. Especially desirable for Florida cruising. Standard motor. Speed 8 miles. Accommodate six persons. Fully furnished for cruising and in commission. Entire outfit new last year. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

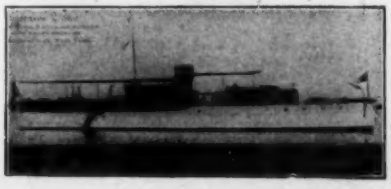


No. 6217—For Sale—Attractive 42 ft. bridge deck cruiser, 9 ft. 9 in. beam, 2 ft. 8 in. draft. Standard motor. Speed 10 miles. Fully equipped. In commission. Owner anxious to sell. Price low. Gielow & Orr, 52 Broadway, New York City.

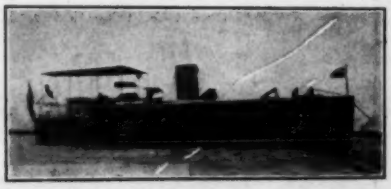


No. 4441—For Sale—Able offshore cruiser, 45 ft. length, 11 ft. beam, 3 ft. 6 in. draft. Extra heavy construction. Electric lighted. Heavy Duty Sterling motor. Speed 10 miles. Accommodates four persons. All perfect condition, fully equipped. Inspectable New York. Price low if sold before laying up. Gielow & Orr, 52 Broadway, New York City.

No. 5403—For Sale or Charter—Desirable 51 foot power house boat, beam 15 ft. draft 3 ft. Suitable Florida waters. Also able seaboat. Standard engine. Speed 9 miles. One stateroom, main saloon. Sleep seven persons. Electric lighted. Fully equipped. Price reasonable. Gielow & Orr, 52 Broadway, New York City.



No. 6053—For Sale—Owner may Charter—Most attractive 75 ft. twin screw motor cruiser, beam 16 ft. 7 in., draft 3 ft. 6 in., built 1917. Equipped 20th Century motors, has exceptionally large accommodations provided by 3 staterooms and large deck saloon. Handsomely furnished and equipped. Price reasonable compared with the present value of yacht. In commission New York waters Gielow & Orr, 52 Broadway, New York City.



No. 4527—For Sale—Desirable 40 ft. raised deck cruiser. Sterling engine. Speed 10 miles. Double stateroom, saloon. Perfect condition throughout. Fully equipped. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

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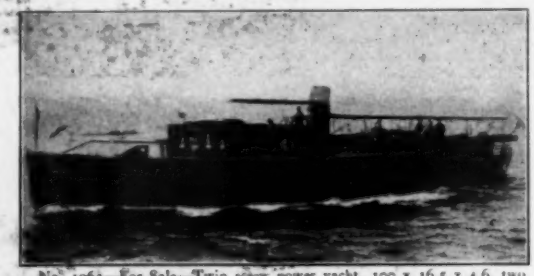
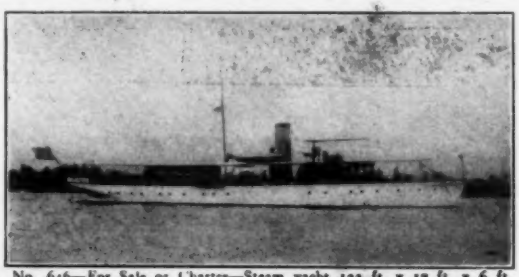


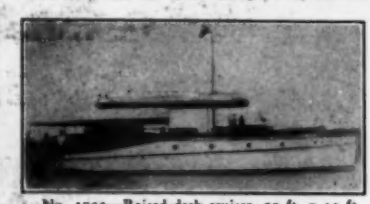
No. 1963—For Sale—Twin screw power yacht, 100 x 16.5 x 4.6, two 20th Century engines, 60/75 H.P. each. Deck dining saloon, 4 staterooms; main saloon, etc.



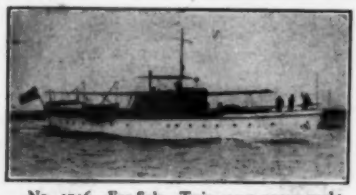
No. 646—For Sale or Charter—Steam yacht 123 ft. x 17 ft. x 6 ft. draft. 5 staterooms, 3 bathrooms. Dining saloon and social hall on deck.

No. 1081—For Sale—Twin screw, 90 ft. power yacht; splendid accommodation. Recently overhauled and 2 new Standard engines, 4 cylinder, 75 H.P. each, installed 1916. Exceptionally able and fully found.

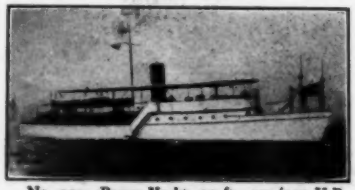
No. 238—For Sale—Steel steam yacht, 170' x 21' x 8' draft. Large dining saloon, social hall and smoking room on deck; 5 staterooms, 3 bathrooms, etc. Completely equipped.



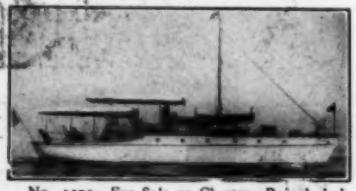
No. 1722—Raised deck cruiser, 55 ft. x 13 ft. x 3.6. Lamb motor. 2 staterooms, main saloon, galley, etc. Price very reasonable.



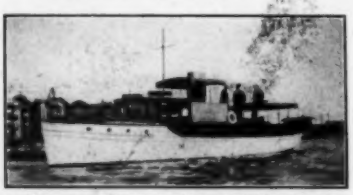
No. 1736—For Sale—Twin screw power yacht, 97 ft. x 16 ft. 7 in. x 3 ft. 6 in. 4 staterooms, bath room, deck dining saloon, etc.



No. 924—Power Yacht, 92 ft., 100/125 H.P. 20th Century motor, splendid deck space.



No. 1270—For Sale or Charter—Raised deck cruiser 55 x 12 x 4.6. Standard engine 32/37 H.P. Has two staterooms, main saloon, galley, etc. William Gardner & Co., 1 Broadway, New York.

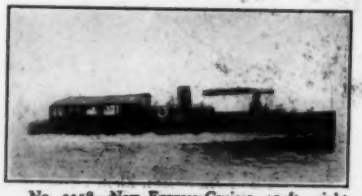


No. 1914—For Sale—Raised deck and cabin house cruiser. 50 x 10 x 4. 50 H.P. motor. Price low.

No. 2386—New Patrol type, 54 x 11.2, eight cylinder Van Blerck, speed 17 miles.

No. 1917—Diesel Power Yacht, 110 x 18, two 6 cylinder 150/180 H.P. engines, low fuel cost.

No. 1738—Raised Deck Cruiser, 65 x 11, six cylinder motor, good accommodation.



No. 2358—New Express Cruiser, 45 ft., eight cylinder, 200 H.P. Van Blerck, speed 22 miles.

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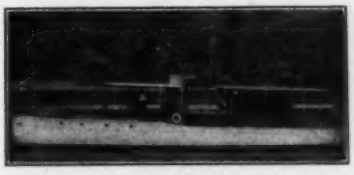
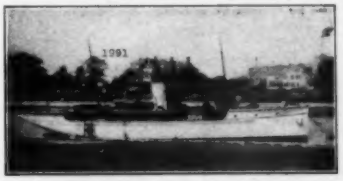
SEND FOR OUR CATALOGUE

1811—60 ft. twin screw express cruiser. Recent build. Speed up to 26 miles.



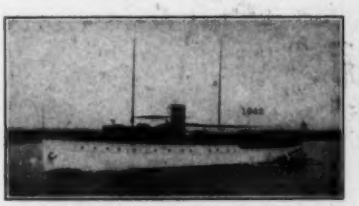
2002—55 ft. cruiser. Double stateroom and main cabin. Bath, etc. Speed 10-12 miles. Located in Florida.

2001—50 ft. cruiser. Double stateroom, main cabin, etc. Sleeps 6 or 7 people. Speed 13 miles.



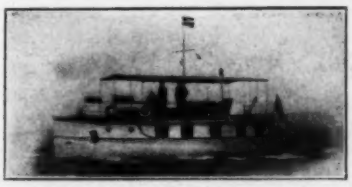
1991—65 ft. cruiser. Double stateroom, main cabin, etc. Speed 11 miles.

1497—50 ft. cruiser. Two staterooms, main cabin, etc. Speed 11 miles.



1942—125 ft. twin screw power yacht. Six staterooms, dining saloon, main saloon, two baths, etc. Speed 12-14 miles.

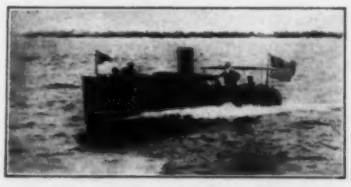
4225—51 foot power houseboat. Three staterooms, main saloon, etc. Speed 8 miles.



1490—43 ft. Mathis Houseboat cruiser. Double stateroom and main cabin sleep six.

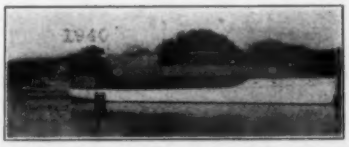
2005—60 ft. twin screw express cruiser. Speed up to 21 miles. Located in Florida.

4231—Sale or Charter—85 foot power houseboat. Five staterooms, saloon, bath, etc. Speed 10-12 miles. In Florida waters.



1997—40 ft. express cruiser. 100 H.P. Motor. Speed up to 22 miles.

1869—42 ft. cruiser. Stateroom and main cabin, sleeps five. Speed 10-12 miles.



1940—65 foot cruiser. Three staterooms, saloon, bath, etc. Speed 10-11 miles. Ideal for Florida.

1941—52 foot semi-houseboat and cruiser. Double stateroom, main cabin, etc. Speed 9-10 miles. Ideal for Florida.

4287—Sale or Charter—90 foot power houseboat. Five staterooms, saloon, bath, etc. Standard motor. Speed 11 miles. In Florida waters. Price attractive.

THE MOTOR BOATING MARKET PLACE

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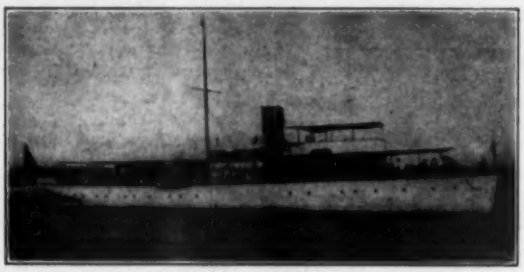
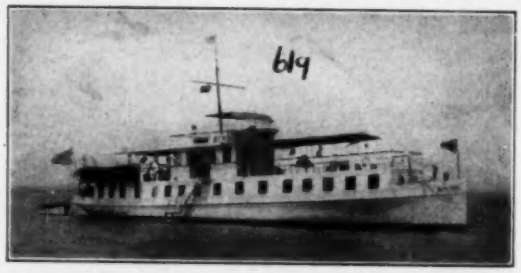
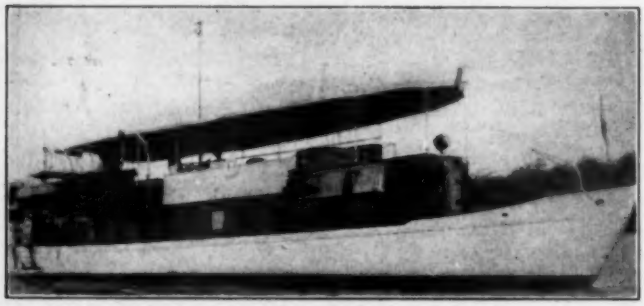


No. 1775—Steel Steam Yacht—length 123 ft.—most modern type—one of the finest yachts of her size—condition good as new—reasonable price.
FRANK BOWNE JONES, Yacht Agent, 29 Broadway, New York



No. 619—For Sale or Charter—Commodious 110 ft. Twin Screw Houseboat. Sleeping 12 persons besides crew. Excellent condition. Harry W. Sanford, 501 5th Ave., New York City.



No. 6030—70 ft. Gasoline Cruiser—built by Seabury Company — Winton 6 cylinder engine — speed 12/13 miles—particularly desirable for southern waters.
FRANK BOWNE JONES, Yacht Agent, 29 Broadway, New York.

For Sale—39 ft. 9 in. long, 8 ft. beam Cypress planked and copper riveted; first class sea boat in good condition; 3 cyl. 4 cycle engine, 20 H.P., A-1 condition. Sell at a sacrifice. W. H. Bulkley, Points aux Pois, Michigan.

No. 355—For Sale—21 ft. runabout. Speed 12-14 miles. Price attractive. Harry W. Sanford, 501-5th Ave., New York City.

A 30 H.P. Mertz & Weiss, 2 cylinder Kerosene Marine Oil Engine, complete with clutch, shaft and propeller, thoroughly overhauled. Bargain. Room 1814. Astor Trust Bldg., New York City.

WANTED—Bridge Deck Cruiser for Florida, not exceeding 45 feet over all. Must have one man control, electric lights, self starter, reverse, complete in every detail and in strictly first class condition. Want comfortable seaworthy boat, not speed. Give lowest price, full particulars. S. B. Ward, 409 Pierce Bldg., St. Louis, Mo.

FOR SALE—One brand new Kemp Machine Works. Aerial engines, Model ¼, complete, has never been used. Address Box 100, care of MOTOR BOATING.

BOSCH Magnetos: All types $10.00 each and up—Coils—Remy, Splitdorf, etc., $3.00 and $5.00—Low Tension Magnetos $3.50—Presto Tanks $5.00—Leather Cushions $1.00—Spot Lights $3.40—Lighting Generators $9.00—Carburetors all types $5.00 and $8.00—Auto Motors, both water and air cooled, all sizes $30.00 each and up. Write for bulletin. Johnston, West End, Pittsburgh, Pa.

Trimount Whistle Blower Outfits
Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.
Made in 3 sizes.

Trimount Rotary Hand Bilge Pumps
All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.
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(Factory: 292 Whiting Ave., East Dedham, Mass.)

CROSBY—Cape Cod Auxiliary, 23 ft. Cat "Psyche" bright finished throughout. New 7½ Mianus-Watercloset. Cushions. Complete outfit. Sacrifice $600. Rosemond, 25 W. 45th St., New York.

A few medium and high speed, one, two, four and six cylinder, four-cycle marine motors, new or rebuilt. Reliance Motor Boat Co., 210th Street and Harlem River, New York City.

WANTED—One second hand crankshaft for Buffalo heavy duty engine, 85 H.P. Will pay good price according to condition. Would buy if price suits entire engine. Address P. O. Box 682, Miami, Florida.

CHEAP for immediate acceptance—Two 7 H.P. single cylinder, 6 x 6½, heavy duty, Eagle engines, guaranteed splendid condition, ready for use, with bronze shafts, stuffing boxes, propellers, also mufflers and coils. Also 10 H.P. two cylinder, Fay & Bowen engine with reversible propeller outfit. Wm Bruns, 325 Central Ave., Jersey City, N. J.

Marine and automobile engines 1 to 100 H.P. Best makes—good condition—very low prices. State your power needs. We take engines in trade. What have you? Magnetos, coils, carburetors, mechanical oilers, water pumps, etc. Also car parts of every nature—sacrifice prices. Write about your requirements.
Badger Motor Company, Milwaukee, Wis.

WANTED—45 to 50 ft. raised deck cruiser, heavy duty engine, outfit must be up to date and in A-1 condition. In reply kindly send cut with full particulars. F. R. Smith, 103 Fort St., Apartment No. 3, Montreal.

CANADIANS, Second-hand engine bargains. Send for list.
GUARANTEE MOTOR COMPANY
73 Bay Street, North Hamilton, Ont., Canada

WANTED—Position as Captain, or engineer of yacht going south. Have traveled inland water route to Florida twice and have had 15 years experience with boats, engines and automobiles. References if necessary. P. T. Blake, 208 E. Andrews Ave., Wildwood, N. J.

FOR SALE—4 cylinder 20 H.P. Vulcan Marine engine, complete with A-K dual ignition, coils, "Petersen" sight-feed lubricator, clutch, thrust and 24 in. x 32 in. B & B wheel. Price $250. Also 40 ft. x 8 ft. x 33 in. Cabin Cruiser, 20 H. P. Vulcan, 10 M. P. H. Price $1200. 24 ft. x 5 ft. Runabout, New 1914. 8 H. P. 2 Cyl. T & M motor, 10 miles. Price $190. Both boats fully equipped. Gordon Baxter. Palmyra, N. J.

FOR SALE—New V bottom runabout hull, 22 ft. long, 5 ft. 3 in. beam. Designed by a naval architect, and built right. All fastening are bronze and brass. 16 gal. copper tank, bronze shaft log and stuffing box. Robbin's Strut. If interested address Samuel Thurston, Rockport, Mass.

WANTED to charter small cruiser with reliable engine for trip down Mississippi river Jan. 1st. J. W. S., 511 Peck Bldg., Grand Rapids, Mich.

Client wishes to sell 60-80 H.P. Murray & Tregurtha gas engine now in his auxiliary schooner yacht. Is four cycle, four cylinders. Up-to-date with high tension jump spark. Ignition Eiseman Magneto. Will sell F.O.B. New York or Boston. Asking $2,000.00. H. H. Jennings Co., 1 Broadway, New York City.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

FOR SALE or EXCHANGE—Auxiliary sloop, 8 months old, Standard engine, 48 ft. x 14 ft. x 3 ft. One toilet, sleeps six, fully found. Owner will exchange for a 45 ft. cruiser or sell outright. Further information will gladly be given. Jas. R. Hensler, Toms River, N. J.

WANTED—Auxiliary or motor boat to accommodate party of five for extended cruising on coast. Draft four feet or less. Box 10, MOTOR BOATING, New York.

NAVAL ARCHITECTS & YACHT BROKERS

Thomas D. Bowes, M. E.
NAVAL ARCHITECT AND ENGINEER
Offices:
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Engineers and Naval Architects
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THE EDWARDS ENGINEERING CO.
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Telephone 960 Vanderbilt

TAMS, LEMOINE & CRANE
Yacht and Ship Brokers
Naval Architects
Marine Engineers
52 Pine Street New York

Victory

(*Continued from page 7*)

with development in motor boating and yachting. One is impossible without the other.

With the coming back into civil life of thousands and thousands of young men now in the Navy and Naval Reserve, a new era is to be born of recreational life upon the water. These thousands, a majority of whom had never before tasted of salt water, have now been trained in a love of the sea which they never will forget. It has become a passion that cannot be overcome. There can be but one result. They will become yachtsmen and boat owners. A season hence those who are prepared will reap the reward.

But is the industry of manufacturing and selling boats, engines and their accessories, prepared for what is before them? At the present writing most of them are not. The time is short before all of this will happen. Uncle Sam moves quickly. Tomorrow may see these thousands of young men ready and headed for the salesrooms. The studying of catalogues has already begun. Advice is already being sought of those who have had experience afloat with motor boats.

There is no doubt but that developments in engines and boats which are sure to come are going to be along sane and rational lines. Of course we shall always have freaks and impractical outfits but they will be few in number, short-lived and the proportion of these to the real boats which are to come will be so insignificant that the freaks will sink into oblivion.

The real secret of the success of industry is to be the development and production of craft which will endure from year to year with a minimum of care and upkeep. Comforts and convenience should be the ideals whether it be in the small open boat, the mammouth motor cruiser or any of the thousands of possibilities in between. This does not mean in any sense the sacrificing of speed and seaworthiness as these are factors of comfort and conveniences which are as vital as the reliability of the power plant itself and cannot be overlooked. In fact, there are so much vital factors which go into the composition of a sane boat that there is a chance for many master minds to give much thought to the subject before the ideal is reached.

In the past, have had the express cruiser which at one time promised to be very popular but this dream blew up in a puff of smoke. There was a reason and the reason was simply this; about 99 per cent. of the thought and effort was directed toward obtaining extreme speed. The result was as one would naturally expect—generally failure either at the beginning or after a few trips out in the open. On the other hand we had the other extreme, the type of boat generally referred to as the "tub," the relic of ages past, on which everything was unreliable and out of date. Such an outfit did as much to disgust the general public with boat-

(*Continued from page 60*)

110-Ft. Yacht "CONSUELO"

Sixteen Years' Designing Experience
Specialty Seagoing Yachts
J. MURRAY WATTS, N. A.
328 Chestnut St. Philadelphia

BRUNS, KIMBALL & CO., Inc.
115 Liberty Street New York City
Offer over 200 re-built engines, backed by a strict guarantee, at especially attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Gray-Prior, Doman, Missouri, Universal, 4 cycle; Eagle, Hartford and Arrow, 2 cycle; Missouri heavy oil engines, simple and economical. Burnell, heavy duty 4 cycle heavy oil engines, quick starting, economical, easy to operate. Write for offer.

K-A-U-R-I
TRADE MARK
Waterproof Spar Varnish
For all OUTSIDE AND INSIDE work. Defies Salt Water. Guaranteed.
Brooklyn Varnish Mfg. Co. Brooklyn, N. Y.

USN DECK PAINT
for porches, floors and walls
DRIES HARD OVERNIGHT
Just the paint for your boat. Durable, lasting, economical. Does not soften under heat. Write us if your dealer hasn't it.
THE BILLINGS-CHAPIN CO.,
1167 E. 40th Street, Cleveland, Ohio
Boston New York

BULL-DOG REVERSE GEAR
"The Gear that Hangs on"
Smaller, simpler, lighter, more compact and more accessible than any other gear of its capacity. Enclosed and oil-tight.
4 Sizes—1 to 64 H.P. per 100 R.P.M.
Satisfaction Guaranteed or Money Refunded.
ATLAS MACHINE WORKS
Successors to Kennedy Machine Co.,
797 St. Aubin Ave., Detroit, Mich.

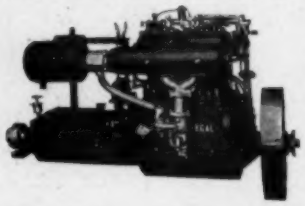
GASOLENE ENGINES
4 to 400 H. P.
Heavy Duty and High Speed
Noted for Reliability
MURRAY & TREGURTHA CO.
South Boston, Mass.

40 H. P. VALVE IN HEAD
Knox VALVE-IN-HEAD
$1300
COMPLETE WITH ELECTRIC STARTER AND REVERSE GEAR
KNOX MOTORS ASSOCIATES, Springfield, Mass.

KEYLESS RADIUM DIAL CLOCKS
The ideal clock for every motor boat, cruiser and yacht. The Radium Dial makes the hands and numerals visible at night.
Adopted by the U. S. Navy for Airplanes.
Price $15.00. Other clocks from $2.50 to $6.00.
Write for details and prices.
Keyless Auto Clock Co., 246 West 59th St., New York City.

ANDERSON ENGINES
ASK ANY USER
Anderson Engine Co., 4012 N. Rockwell St., Chicago.
New York Office, N. W. Cor. Broome & Lafayette Sts.

FISHING BOATS
require serviceable engines



REGAL
Four-cycle Gasoline and Kerosene
engines have been on the market for seventeen years. Let us tell you about them. 2 H.P. to 50 H.P., one to four cylinder.
Regal Gasoline Engine Co.
74 W. Pearl Street Coldwater, Mich.

ELECTRICAL HEATING AND COOKING DEVICES
for Motor Yachts and Motor Yacht Builders
Flat Irons, Toasters, Grills, Toaster Stoves, Curling Iron, Heaters, Soldering Irons, Air Heaters, Glue Pots, Etc.
American Electrical Heater Co. Detroit, U. S. A.
Write for Illustrated List, Prices and Descriptions. Oldest and Largest Exclusive Makers. Estab'd 1884.

LYKNU POLISH
WILL MAKE YOUR BOAT JUST LIKE NEW

POLARINE
The Standard Oil For All Motors
Standard Oil Co. of New York

TUNGAR
BATTERY CHARGING
Give longer life to storage batteries.
Three Sizes: for clubs and private boathouses.
General Electric Co.
Schenectady, N. Y.
35A-2

Wittemann-Lewis Aircraft Company
Flying Boats & Airplanes
Newark, New Jersey

The Navy's Job Is Just Half Done!

EVERY soldier who sailed for France was given a round-trip ticket. The Navy took them over and now the Navy must bring them back. There can be no relaxation of effort until the job is done, until every one of our boys is returned to his home. To complete this task the Navy needs more men, and the need is just as urgent now as it was before the armistice was signed. This condition offers you an opportunity to be identified with the Great War, your *last chance*.

The cancellation of the November draft call has deprived thousands of men of the privilege of participating in the war, but the Navy's call for men enables you to volunteer your services. If you can qualify for any of the vacancies now existing, you may be inducted into the service at once.

Men are needed now, if not to fight, then for services equally essential to the re-establishment of normal conditions. The Bureau of Navigation has issued a call for several hundred men who can qualify for posts which require specialized ability. Only those who are registrants of September 12, 1918, or registrants of deferred classifications of previous registrations are eligible. Applications will now be received for training in the Deck Officers' School of the Naval Auxiliary Reserve. Applications for induction in this branch of the service must possess an education equivalent to a high-school course, including a good knowledge of trigonometry and logarithms. The age limit is twenty-one to forty years, inclusive.

Further information and full particulars will be furnished upon application at the U. S. Navy Mobilization Station, in the Transportation Bldg., Chicago, Ill. Mail should be addressed to Lieut. H. D. Childs (Ret'd), Commanding Officer.

Motor Boats That Won the War

(*Continued from page* 13)

cruise at the present writing. Starting from forward is the forepeak, then the crews head and quarters, with twelve berths. This compartment contains mess gear and small hot water boiler which heats the ship. Next is the forward ammunition room, opening into the officers' quarters, in which are two staterooms, toilet with shower bath, and radio room. This compartment has a gas-tight flat, under which are stowed the fuel tanks of heavy galvanized steel, total capacity 2,400 gallons. Next is the engine-room with the three main engines and auxiliary pumping, air-compressing and lighting engine; batteries, air tanks, work bench, etc. Then the after ammunition roof, aft of which is the petty-officers' stateroom, officers' mess room, galley and lazarette. Good ventilation for below, when hatches are battened down, is provided by electrically driven blowers.

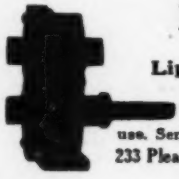
The proof of the pudding is in the eating. The "S. Cs" were conceived and built in a hurry. The French Ad-

(*Continued on page* 60)

Baldridge Reverse Gear
has every good feature that any other good reverse gear has—and then some.
The BALDRIDGE is a clean gear. Its perfect enclosure keeps all grease in the gear where it belongs.
THE BALDRIDGE will work for you a long, long time. Salt water cannot get in and rust out its parts.
THE BALDRIDGE unbroken mainshaft absolutely prevents your gear from sagging and getting out of alignment.
Immediate deliveries are now possible if you act quick.
The reverse speed is 66⅔% of the forward speed.
Send for booklet, "For the Man in the Boat"—Free.
The Baldridge Gear Co.
Boston, Mass.

WHITING-ADAMS
That name is all you need to know about the brush. It guarantees highest quality; longest wear, lowest price.
JOHN L. WHITING-J. J. ADAMS CO.
Boston, U. S. A.
Brush Manufacturers for Over 100 Years

Euclydes de Souza Lima
Agent for engines and various kinds of machinery.
P. O. Box 254
MANAOS, AMAZONAS
North Brazil South America



PUMPS
Made by the
Lipman Mfg. Co.
for circulating purposes are the very best. Hundreds of Thousands in use. Send for Catalogue.
233 Pleasant St. Beloit, Wis.

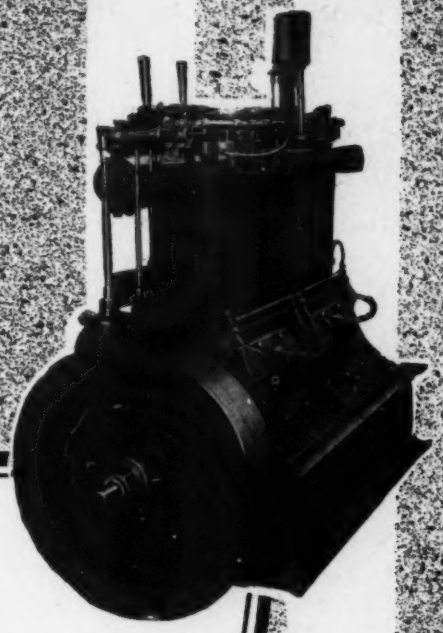
"BEAUTIFUL BOATS
and How to Care for Them"
A book about boats, with beautiful water colors by Félicie Waldo Howell, and methods for keeping all kinds of craft seaworthy. It is Free to those who write for it.
MURPHY VARNISH COMPANY
NEWARK CHICAGO

Sootless THE BRASS PLUG $1.25
The Aristocrat of Spark Plugs
DAMPNESS AND SPRAY PROOF
The Brass shell won't rust into cylinder head
OAKES & DOW, 40 Chardon Street, Boston
NO PORCELAIN TO BREAK

Quayle

Oil-Burning Marine Engines

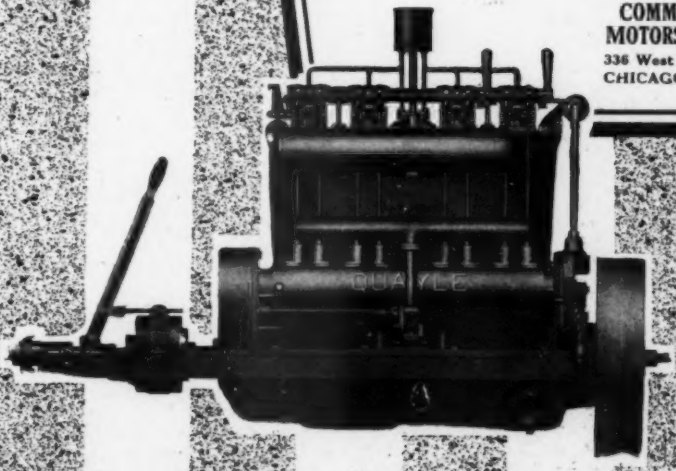
(Hvid Type)



The Quayle Oil Burning Marine Engine is specially adapted to use in cruisers, power boats, launches, fishing boats, freight boats and other small commercial craft. It possesses every advantage of the gasoline burning power plant with none of its disadvantages. It starts easily, operates smoothly and gets every ounce of power from the fuel—there is no waste or inefficiency. The Quayle will burn any of the heavier free flowing oils including kerosene, polar oil, vegetable oil, fuel oil or fish oil—it will not operate on gasoline. It produces maximum power under any conditions and will pay for itself in 300 days by the saving in fuel costs. It will take you twice as far on six cent fuel as the high priced gasoline. It's simple in operation and construction—there are no complicated parts to get out of order or confuse you. The Quayle has no carburetor, magneto, batteries, spark plugs, ignition points, make and break ignitor, coils, timer, wires, switches, hot torch, tubes, plates, fuel pump or high duty compressor. It's built for work all day, every day.

Send for our big catalog.

COMMONWEALTH MOTORS COMPANY
336 West Madison St.
CHICAGO, ILLINOIS



For Heavy Duty Work

We Announce Future Plans

Our Victory Number

THE February issue of MoToR BoatinG will be a Victory number, dedicated to the yachtsmen of the country who have joined our naval forces and contributed so materially toward winning the war. We hope to print the names of all motor boatmen and club members who went into the naval service, together with the pictures of those men which are available, as well as a description of the particular work which they performed in the fight for democracy.

We ask the co-operation of all our readers in getting together a complete list of all yachtsmen in the service. If you will send us the names and addresses of any yachtsmen of your acquaintance or members of your club, we will see that they are communicated with and included in the Victory number of MoToR BoatinG.

Many yachtsmen turned their craft over to the Government for war purposes. Many of these boats have performed service little short of wonderful. We hope to show illustrations of many of these boats with an account of their activities. Therefore, if you know the names of any boats taken over by the Navy Department, we ask you to send us their names so that we may get in touch with their owners.

The Victory number will include also many articles written by men who have been on naval vessels during the war and whose stories of their experiences have been barred by the censor until now. Altogether, the February number will be one of the most interesting ever published.

My Ideal Auxiliary Series

BEGINNING with the February issue of MoToR BoatinG a new series of designs will appear along lines similar to the Ideal Cruiser and Ideal Runabout series. The new series will be called "My Ideal Auxiliary." Each issue will contain a complete design, including outboard profile, arrangement plans, sections, construction details, a full set of lines, and table of offsets. As in the two previous series the plans and descriptions must be the work of amateur designers.

Any amateur designer who is interested in auxiliaries may submit plans of My Ideal Auxiliary series. There is no limit on the size, type or speed of the craft.

Designs may be submitted any time after December 1, 1918, up to May 15, 1919. The drawings must be in ink on white paper or tracing cloth but may be to any scale the designer may choose. We would suggest that all figures and lettering on the plans be of such size, that they will be legible after the plans are reduced to a size suitable for reproduction in our magazine.

A description of not over 2,500 words should accompany the plans. Too much space should not be devoted to construction details either in the plans or description as they are more or less similar in all boats.

For each set of plans which we publish we will pay $35 in cash. In addition to this a prize of $65 worth of boat equipment of his own selection will be awarded to the designer whose plans receive the greatest number of votes by MoToR BoatinG subscribers.

Those who send their plans in early will stand a much better chance of having them published. As the closing date approaches we receive scores of plans but are able to publish only the very best of the lot. So take advantage of the opportunity and send your plans in early.

In the next issue of MoToR BoatinG we will publish the plans of the entire series of ten Ideal Runabouts that have appeared in this and the nine preceding issues of the magazine. The plans will all be reproduced to the same scale so that the various designs can be easily compared. Every subscriber will have an opportunity to register his preference and the amateur designer whose plans receive the greatest number of votes will be awarded a prize of $75 worth of boat equipment of his own choosing.

The plans of these trim little boats have been the subject of many favorable comments and we have already heard of several instances where advantage is being taken of the completeness of the plans and descriptions and boats are being built from them. We hope to hear with what success this little fleet, all designed by amateurs, will take to its natural element next season.

Bayside Yacht Club Honor Roll

NAVY

Lieut. Walter L. Powers
*Lieut. Frank L. Stiles
Lieut. Walter S. Dayton
Lieut. Walter J. Lee
*Lieut. Malcolm Mackenzie
*Ensign Alexander W. Moffatt
Ensign Donald Cowl
*Ensign Walter P. Groszmann
Ensign Norman E. Donnelly
*Ensign Leonard E. Beard
*Ensign Fred C. Smith
Ensign John Adikes, 2d
*Q.M. C. Lawson Willard
Q.M. J. Paul Falconer
*Q.M. Louis B. Warner
*Q.M. Ferris P. Smart
*Q.M. Edward G. Walsh
*Q.M. Chas. H. Medicus
Richard R. Walsh
*Arthur Logan
Chas. A. Gould, 2d
*Anson G. Purchase
Edwin Logan
*Carlton Copp
Wm. Nash Webb
Harold C. Vause
Richard Dorgan
Bruce Aitchison
*Bertram Darling
Howard Keppel
Oliver Alford
Charles Norton Thomas
Val P. Fogh
Sheldon Deardon
*David H. Markell
Edwin Shuttleworth
Charles B. Struthers, Jr.

ARMY

*Major George Sykes
Major Bradford Butler
*Capt. Edward C. Welsh
*Capt. George F. Miles
*Capt. F. G. Huntington
Capt. Marshall L. Coleman
*Capt. Charles T. Arrighi
Capt. Wm. A. Kenyon
*Capt. Edward B. Hine
Capt. L. G. Peed
*Lieut. Walter M. Collins
*Lieut. P. W. Kerr
*Lieut. Chas. M. Swezey
*Lieut. Frank H. Van Winkle
*Lieut. Van Wagenen Pingry
*Lieut. Chas. H. Mellor
*Lieut. J. C. Crisman
*Lieut. Philip E. Langworthy
*Lieut. W. S. Hawkins
*Lieut. Claude G. Leland
*Lieut. Robert D. Boyle
*Lieut. Philip Benson
*Lieut. Francis Wakem
*Lieut. Percy C. Hope
*Lieut. H. P. Rust
*Lieut. W. W. Knowles
Lieut. Harry W. Everett
*Lieut. Howard R. Baker
Sergt. Douglas Van Riper
†Corp. William A. Leonard
Corp. Chas. B. Stone
*Corp. Henry K. Adikes
*Walling E. Harvey
†Roland E. Phillips
*Thomas F. Herrick
*George J. Gillies
Lewis A. Hallock
*George Frey
George W. Shields
George I. Barber
David H. Woodruff

Y. M. C. A.

*Frederick G. Randall
*Charles L. Willard

* In foreign service.
† Killed in action.

A Remarkable Record

THE Bayside Yacht Club has a membership of 300 seniors and forty juniors. Of these, eighty enlisted in the service which is about one in four. Of these, exactly half are line officers in the Navy or commissioned officers in the Army. Of the total number sixty per cent. are in active service on foreign soil or in foreign waters.

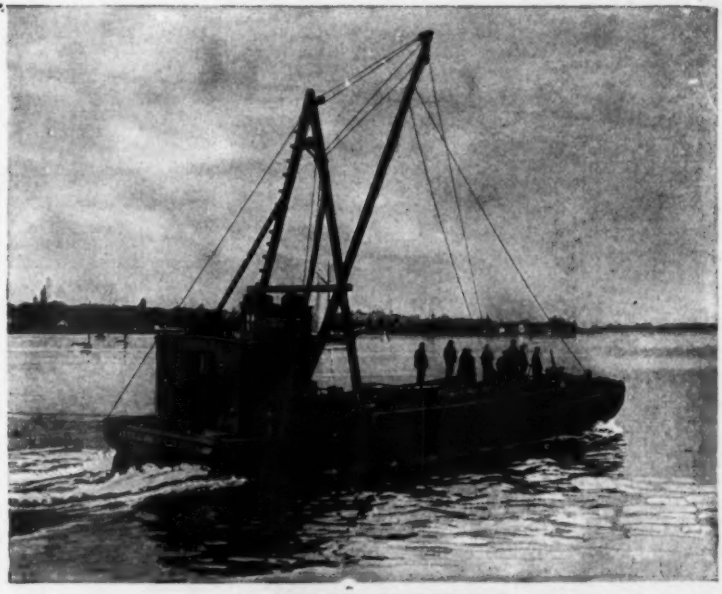
The officers and members of the Bayside Yatcht Club are to be congratulated on this remarkable record. Although all yacht clubs have responded most faithfully to the country's call for fighting men, yet we have heard of none which equals this record made by the Bayside Club.

Exportation of Second Hand Articles Composed of Iron or Steel

THE War TradeBoard announce that on and after November 1, 1918, all applications for licenses to export second-hand articles composed of iron or steel will be required to state on form X that the commodity to be exported is "second hand." Failure on the part of the applicant to describe second-hand material as such will be regarded as an inaccurate description of the goods and the applicant will be subject to the prescribed penalty therefor.

EGYPTIAN
DEITIES
"The Utmost in Cigarettes"
Plain End or Cork Tip
People of culture and refinement invariably PREFER Deities to any other cigarette.
30¢
Anargyros
Makers of the Highest Grade Turkish and Egyptian Cigarettes in the World

SAVE FUEL



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This lighter is equipped with two 32 H.P. gasoline engines and one 65 H.P. GALUSHA GAS PRODUCER, which makes gas out of coal for use in the engines instead of using gasoline. It takes but 70 pounds of coal per hour, at a cost of 28 cents, whereas the engines formerly used 12 gallons of gasoline per hour, costing $3.00; saving $27.20 in ten hours or $8,160.00 in 300 days of 10 hours each.

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Air drive 3 & 5 H.P. for light pleasure and freight boats. Write for catalog and prices.
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Write for catalog of materials and measuring chart. Send us measure of your old frame and we will send new cover cut to fit.
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IMPROVED THERMEX SILENCER
Increases Revolutions, No Back Pressure!
Cannot clog, nor collect salt; water cannot flow back to cylinder. No heating, no odor. Used free or under water—adjustable discharge. Lightest, cheapest to install. Free booklet shows why. Send for it today.
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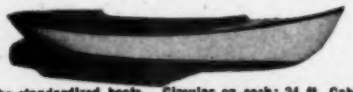
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The safest little sea boat built, will stand the ocean waters.
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OUTFITS OF QUALITY
AUTOMOBILES
ALWAYS READY

DAY OR NIGHT
MOTOR BOATS
MANUFACTURED BY
THE LEECE-NEVILLE COMPANY
CLEVELAND, OHIO

Where Motor Boats Handle Millions

(*Continued from page 16*)

by navigable streams. The population of the state is approximately 2,000,000, and of her 28,000,000 acres of land, only 5,500,000 are cultivated, yet from these came, in 1917, crops valued at $150,000,000.

Here enter the freight- and passenger-carrying motor boats, such as those which daily jam the Bienville street landing in New Orleans and fill other railway terminals in Louisiana, unloading cargoes of all manner of produce of the soil and taking back to the parishes the manufactured output of the cities.

They range from 10 tons to 50 tons, and they operate as far as 200 miles from New Orleans, where the majority of them have their home port.

Their engines are as varied as those of the fish boats, though the Buffalo, Winton, and Frisco Standard appear to have the preference, about in the order named. By their aid the dweller in the hinterland of Louisiana gets everything from a cow to a clothespin, and frequently the boat which carries his crop to market, takes back to the farmer his seed for the next year.

Within the last year or two an effort has been made to introduce into the rice and sugar-carrying trade, shallow, wooden barges, some 240 feet long, by 20 to 30 feet wide, dirven by heavy-duty engines of 6 to 9 h.p. and carrying 60 to 75 tons of sugar or rice slowly and at small expense down the wider water courses to the rail terminals at New Orleans, Morgan City, Lake Charles, Baton Rouge or some similar port.

At first these barges, built as experiments, met with some success, but their unwieldiness, and the frequency with which they ran aground on mud and sand bars, as well as their slowness of movement, has almost precluded their use, the rice and sugar planter preferring to handle his crop on barges towed by motor tow boats.

Incidentally, these motor tugs have begun to show their value in almost all the water side towns on the larger streams in Louisiana and several have made their appearance in New Orleans Harbor. Cheapness of operation when oil engines are used, and the elimination of about half the crew required by a steam tug, are factors in favor of the motor tug, while the need for seagoing ability in two boats in New Orleans Harbor has worked in favor of the steam-driven craft for this work.

Nearly a score of ferries in Louisiana, several of them across the Mississippi River itself, are motor boats. They handle their passengers in their own hulls, and their freight on barges, carrying teams and wagons and automobiles even across the Mississippi,

(*Continued on page 60*)

CROCKETT'S
Spar Composition
—the original and best known exterior marine varnish in the world. The best Interior Finish is Crockett's
NO. 1 PRESERVATIVE
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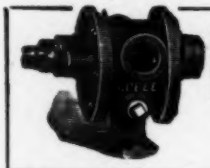
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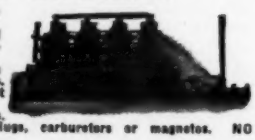
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on your bulkhead insures accurate dead-reckoning. You can read your boat's speed any time with less effort than looking at your watch.
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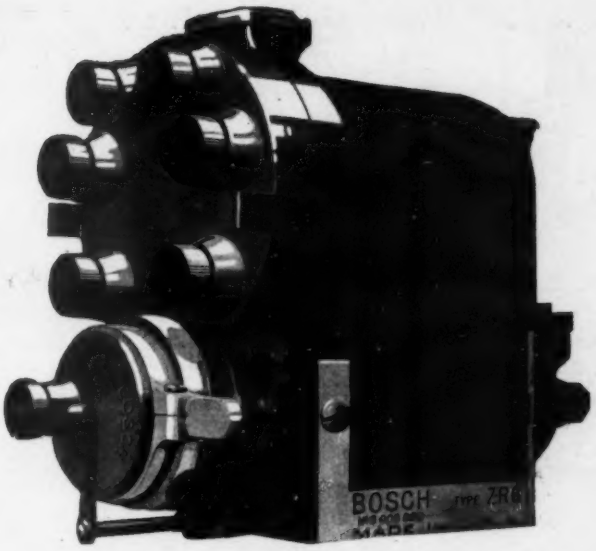

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Bosch Magnetos were in the thick of it. They underwent the most vigorous of all tests, and never did they serve or endure better.

Where reliability must be absolute, there the Bosch Magneto is used. Its rip-roaring sparks make every drop of "gas" yield every ounce of power. Its rugged, staunch, shock-proof construction gives the positive assurance of steady dependability that marine service demands.

Because they recognize this, experienced and far-sighted manufacturers are willing to pay the slightly higher cost of Bosch Ignition. They know that its superiority over ordinary systems is well worth the difference. They realize that the continued satisfaction and good will of the customer must not be jeopardized; a slight increase in manufacturing cost must not stand in the way.

For the new boat—for refitting next spring—remember that ignition is vital, most vital. Write Bosch Magneto Ignition on the order.

Be Satisfied ***Specify Bosch***

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THE CAILLE PERFECTION MOTOR CO.
582 Caille Bldg. Detroit, Michigan, U. S. A.

Where Motor Boats Handle Millions

(*Continued from page* 58)

as does the ferry at Nine-Mile Point, on the upper edge of New Orleans.

Another unusual use of the motor boat in Louisiana is as a delivery wagon by traveling men.

Such of these boats as have been built in southern yards by men familiar with the conditions under which the craft will operate, have given better service than those imported from northern yards, largely because conditions of motor boat work here are different from those elsewhere in the United States.

Victory

(*Continued from page* 53)

ing as did the much maligned express cruiser. There is a balance—a proper balance between these extreme types which can be found but it is up to the industry to perfect this balance—the engine manufacturers, the naval architects, the boat builders and the accessory dealers must do it. You cannot expect the public to tell you how to do it—that is your job. The public will respond when the proper time comes but when that proper time is to be is up to the industry.

This is an age when the public demands and requirements must be satisfied or they will lose interest. They will be eager to purchase anything which suits and pleases them. If it does not, then they are not interested. It is not up to them to tell you what they want for they don't know.

Take for example a man buying a car for the pleasure and comfort of his family—something to give them recreation and to take their minds off their troubles. What kind of a car does he buy? A little unreliable make with a two-cylinder motor, uncomfortable seats, small tires, no springs, top, etc.? No he gets the best his purse can stand, a snorting 6, 8 or 12 cylinder motor, a car having all conveniences, ready to go anywhere, any time, a motor with power so that when he steps on the accelerator it responds with vim and makes red blood flow through his veins. It's human nature and until motor boat practices approach this condition we can but fail.

Motor Boats That Have Won the War

(*Continued from page* 54)

miralty like them so well that it bought fifty of them from Uncle Sam, followed by fifty more built to order, with minor refinements, when their ability was proved. Our Navy liked them well enough to order fifty more to replace those sold to France. Nothing is being said, or can be said now, about what the little ships are accomplishing. We have heard of the part taken by the British "M. Ls" in the bottling raids on the Hun submarine bases. Our "S. Cs" are more able than the British boats. France and Uncle Sam both placed re-orders. The inference is obvious.

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Model L-2 2 H.P. for canoes, rowboats, fishing and hunting boats.
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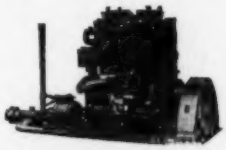

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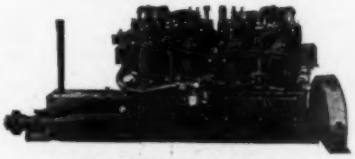

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The Honest Clay is particularly popular with fishing companies, lumbermen, supply boat and general towing service, who appreciate a reliable heavy-duty engine that will operate economically 365 days a year.

For over 21 years the demand for Honest Clay engines has been created largely through the mouth to mouth advertising of satisfied users. No systematic effort was made to sell them, either direct or through dealers, as the original company could seldom build enough engines to supply even 25 per cent of the demand for Honest Clays.

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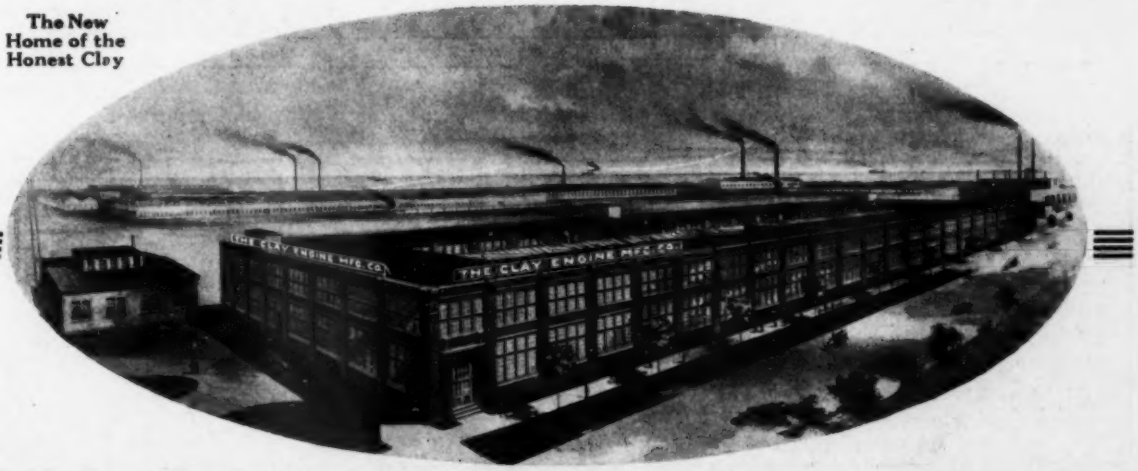

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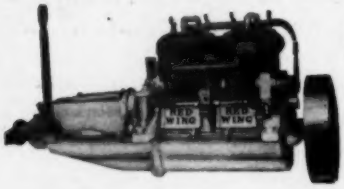

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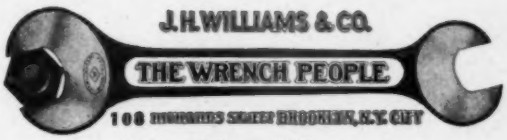

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Get More Power. Greater Speed. Smoother Operation. Longer Service. New Stromberg Carburetor for Marine Engines "does it."
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We make them for the leading builders of marine, airplane and automobile motors. We are Integral Camshaft Specialists, insuring the utmost in quality of workmanship and materials, accuracy and uniformity.

Let us quote on your designs.

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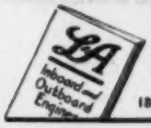

—it gives valuable information about motor boat engines. It describes the full line of L-A inboard and outboard motors and tells of the 30 days' free trial plan.
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New York Chicago

Gasoline in Abundance for All Times

(*Continued from page 17*)

transcontinental or even transatlantic aero-mail service is no longer a wild dream, but an almost accomplished fact. The fuel oil burning steam ship and locomotive have come to stay, and it is a well-known fact that practically all of the big shipbuilding countries are turning more and more to the use of oil, for it has been proven beyond a doubt that it is more economical and better than any product yet brought forth. What is true on the sea is equally true on land. It is no idle dream to say that the petroleum industry is in its infancy, for the statement that we are just at the beginning of this great modern industry is substantiated by facts.

The question naturally arises: will it be possible to meet the demands imposed upon the product? And I unhesitatingly say that while it is true the uses of petroleum are just being realized, the big production of the world is also just beginning and there need be no fear that there will not be an ever-increasing supply for many years to come in the new oil fields yet to be developed. The great Mexican, Central and South American fields are already regarded as the future oil reservoirs of the world and there are many sections of this country which will be opened up and developed when conditions return to normal and development can be worked to its utmost. It is not my intention to go into this feature of the subject, but I take the stand, supported by a well-known scientist who recently made the statement that he considered it highly probable that there is a sufficient supply of crude oil in the earth to supply all demands as long as the earth is inhabited. This theory seems to be more strongly supported than that of the early extinction of the supply and is certainly a much more cheerful view to take, particularly so as it is amply substantiated by facts.

At this time, with peace here again, the minds of the commercial world are naturally engaged in anticipating post-war conditions. A great many look with apprehension upon the period of readjustment confronting us, and in the petroleum industry, no less than in others, there are problems to be solved. However, it must be borne in mind that the readjustment is bound by necessity to be a gradual process and the writer takes the extreme optimist's view that the transition from war to peace conditions will be effected almost without noticeable impression upon the petroleum industry, so far as supply and demand are concerned. The resumption of activities will naturally utilize large quantities of products, not only of gasoline, but also fuel oil and kerosene, and will thus assure outlets for a large percentage of the petroleum which now goes for war purposes.

MoToR BoatinG's BOOK

Practical Motor Boat Handling, Seamanship and Piloting

is still going strong!

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Read it—it offers a suggestion that will make you a better boatman and a more skilled navigator.

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Advertising Index will be found on page 98

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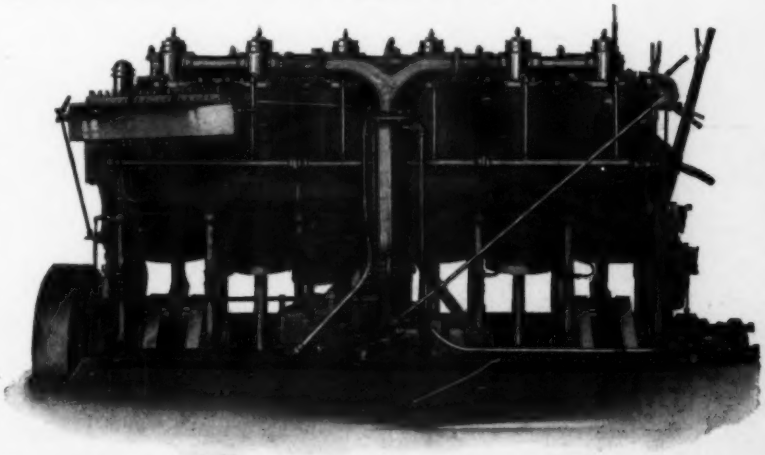
Durazzo

For the first time in the history of the World American ships have fought in the Adriatic.

It was the United States 110′ S.C. boats which added this new page of history for the United States Navy; which led the Allied fleet through the mine fields to the guns of the Austrian fortress,—the fortress 2000 years old when America was born,—the fortress considered impregnable—Durazzo.
And it was

The Standard Engine

in these S.C. boats, the same Standard Engine as in the boats which led the way into the German naval bases of Zeebrugge and Ostend.



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We believe that through the War's lessons and the Standard's historic success the whole world will wish to be served by this engine.

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Back of the Standard Guarantee is the

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SCIENTIFIC IGNITION

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GASOLINE ENGINES AND LAUNCHES
Cos Cob Conn 1/28/18.
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Gentlemen:-
We wish to say that we have equipped all of our four cycle
engines with ATWATER KENT SCIENTIFIC IGNITION in the last
year and are very much pleased with it.
Very truly yours
Palmer Bros.Engines,Inc.
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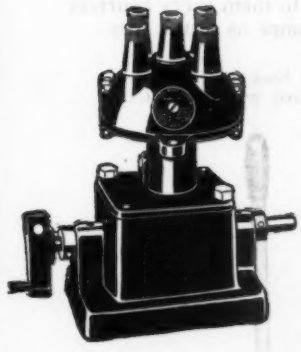

Type H, on Magneto Base
Particularly adapted to marine motor use

THE dependability of Atwater Kent Scientific Ignition even under the most adverse conditions, its mechanical simplicity, and its big hot spark not only improve marine motor performance but establish new standards in starting, power and speed.

It is for these reasons that Palmer Brothers have adopted Atwater Kent Scientific Ignition on their four cycle marine engines.

Replace your magneto with this more efficient source of spark energy.

Our Type H System will operate efficiently on marine motors, either from dry batteries (a season's operation from a set of six), a separate storage battery or a storage battery generator charged. Furnished for 1-, 2-, 3-, 4-, 6- and 8-cylinder motors.

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"America's Standard 4-Cylinder Engine"

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A Reliable Engine for Commercial and Fishing Boats

THE unusual record established by the Kermath in pleasure boat circles is now being followed by a like success in the small commercial and fishing boat field. The requirements of this phase of marine activity are especially stringent; weather conditions are more severe, longer periods of sustained operation are necessary and the personal attention of the owner is usually lacking. The Kermath stands up under these conditions just as consistently as it does under the more favorable conditions found in the pleasure field.

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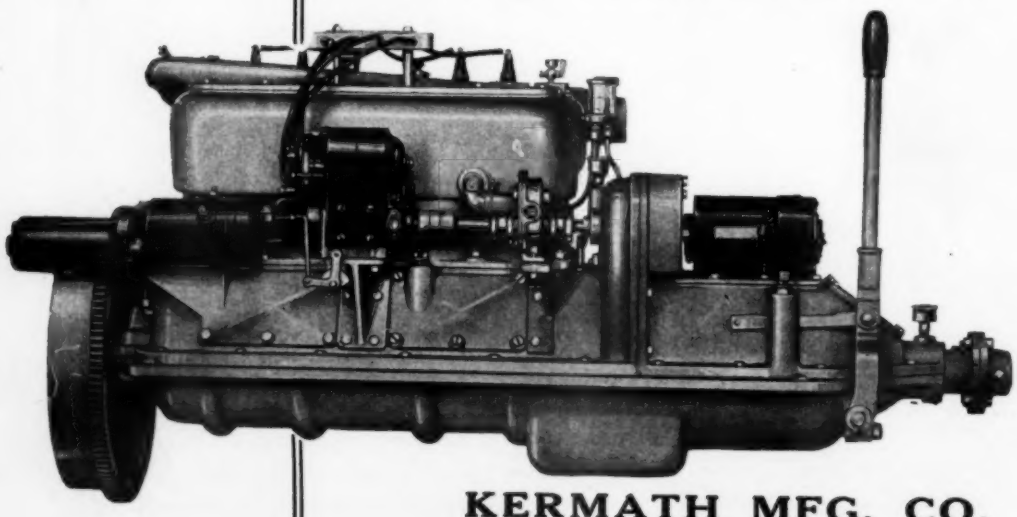

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RICHARDSON BOATS

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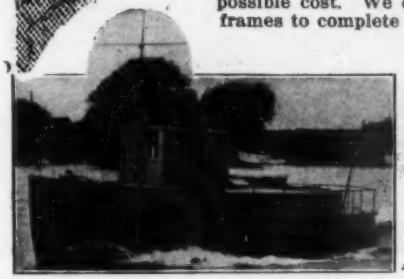
Richardson 25' x 5' 8" Runabout



When you decide to order that new boat, whether commercial or pleasure, why not let us build it for you? Our workmen are the master craftsmen of the industry and our location gives us the pick of eastern lumber stocks. Richardson commercial boats are built to order to meet individual requirements. They embody the features you want at prices that are most attractive.

Write to-day for sketches and estimates.

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No. Tonawanda, New York

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ASK ANY OWNER

"Quality without Extravagance"

The Matthews Boat Co. MARINE RAILWAYS STORAGE BASIN and WORKS Port Clinton, O.

Improved Motor Boat Closet

Figure 1404

Dimensions: 18 x 18 x 11" high to top of bowl; 2½" cylinder. For above or below water line.

The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

All prices subject to market advances, which are continually changing.

Price.....$25.00

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Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of MoToR BoatinG, December, 1907, hundreds of Curtiss fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

With Pump

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

No. 5
Height, 19 in.
Width, 19 in.
Depth Closed, 6 inches.
Quartered Oak Case, Each, $42.50
Mahogany Case, Each, $44.00

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.

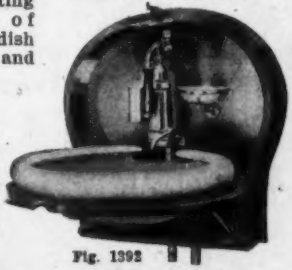

Fig. 1392

THE J. H. CURTISS CO. 2 South Street, New York

20th CENTURY Gasoline Motors

2-Cylinder—6½" x 8½"—15-20 H.P.—400 R.P.M.
4-Cylinder—6½" x 8½"—40-50 H.P.—400 R.P.M.
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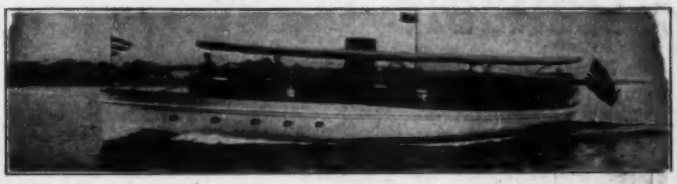
Strictly high grade four-cycle engines, built for heavy duty service.



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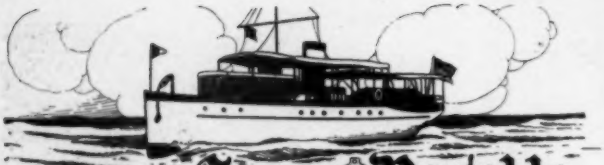

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WHETHER it's a Christmas present for your boy in the service, or for some one at home, you'll find nothing more pleasing than the "Portable." **It has the famous Sonora tone!**

Weighs only 15 pounds complete. Price $60.

At your dealers or write direct to

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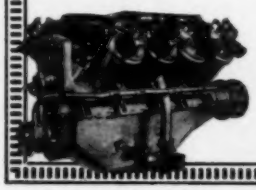
AEROPLANE MOTORS FOR SALE

We have eight Aeroplane Motors for Sale. These motors were especially built for aeroplane service, but due to changes in design are not suitable for present use. Will make wonderful speed boat motors.



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ENGINEERS and MANUFACTURERS
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Will quote on propelling machinery installed complete aboard ship.

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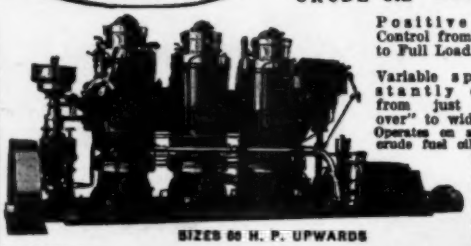

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Positive Governor Control from No Load to Full Load.

Variable speed instantly obtainable from just "turning over" to wide open.

Operates on any of the crude fuel oils or kerosene. Absolutely reliable. Fuel consumption .55 lbs. per H.P. hours.

KAHLENBERG standard engines in medium and heavy duty types are made in sizes from 2 to 84 H.P. and we would strongly recommend them for operating on KEROSENE, SOLAR OIL, and GAS OIL. You ought to know more of the exclusive advantages the KAHLENBERG offers you. Write for our literature stating your requirements fully.

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Best Steerers Lowest Cost All Types in Stock

Price, $40 Complete

Effect great economy in use. Positive control — no back lash. Installed in DISTURBER IV

We also manufacture All Cast Bronze Concealed Wire Searchlight with Patented Control. Rope Steerers. Marine Fittings

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Lights Out at Night!

It might happen in midstream. This is the risk you run when you have to *guess* at the power supplying your electrical equipment. But if you install a

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Model 301 Ammeter
On Your Bulkhead

You can tell exactly, and at all times, the rate of charge or discharge of the battery. You know *before it is too late* whether your battery is being maintained in the condition which will assure you perfect service.

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A Reliable Light Weight Inboard Motor

If your requirements call for a light weight inboard motor that will render maximum service at all times you should by all means examine the Arrow-Waterman line of marine power plants.

Waterman Model K-1 inboard, one cylinder, 2½ H. P., weight 30 lbs., bore 2¾", stroke 3"; engine equipped with aluminum crank case and base and copper water jacket. For your canoe or small boat.

THERE is an ever-increasing demand for motors of this type for use in tenders and other small boats. The important factor in selecting a motor of this kind is weight; it is absolutely necessary to secure an engine that is not too heavy and yet that is built sturdy enough to withstand constant usage. The Arrow-Waterman line is manufactured to meet this demand and has earned an enviable reputation for consistency of performance, economy of operation and all-'round dependability.

Arrow Waterman motors may be seen at Room 624, 30 Church Street, and at Ruppert and Colson's, Concourse, 50 Church Street.

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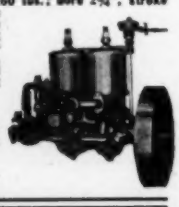

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Factory: Newark, N. J.

Foreign Office, 47 Broadway, New York City **J. E. Sitterley, Foreign Sales Manager**

Universal Specialties

Complete Class I Equipment	$ 4.50
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Set of Lamps for Class I	3.80
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Two-tone Horns	.90
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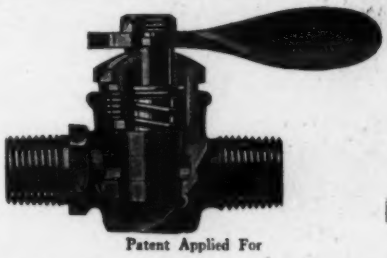
Complete catalog upon request.

UNIVERSAL Motor Boat Supply Co.

Atlantic Highlands, N. J.

Kant-Leak Gasoline Cocks



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1. The stem is packed.
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3. The bottom is closed.

Michigan Kant-Leak gasoline cocks are absolutely proof against leaks by reason of their improved design. Write for Kant-Leak circular giving full details and prices.

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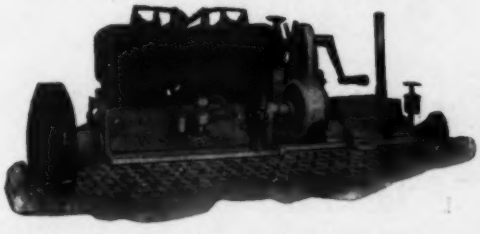
GRAY MOTORS

Largest Builders in the World of Small Marine Motors

20 to 24 H.P. model D 4-cycle Immediate Delivery **$450** and up. Used in U. S. Coast Guard tenders.



The Easy Starting, Economical Engine for work boat, small cruiser, house and pleasure boat—clean and silent in operation.

Two Cylinder, 4 Cycle
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Guaranteed by an old responsible company.

Send today for big instructive catalog.

Immediate delivery—today—from stock

2-cycle, 3 to 6 H.P., single and double cylinder, $74 and up. Immediate Delivery

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Which Boat Goes the Fastest and Saves the Most Fuel?

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GRAY-PRIOR
FOUR CYCLE MARINE MOTORS
Built up to a Standard—not down to a price

A Clean-Cut Power Plant

For Commercial Boats and Cruisers

Model D-4, Medium Heavy Duty

36 Horse Power **Bore, 4½ inches** **Stroke, 6 inches**

Write today for full description and prices

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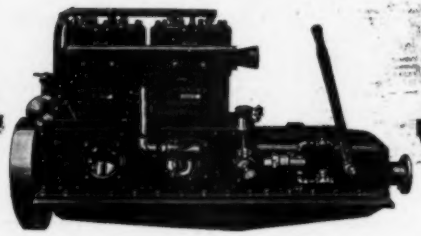
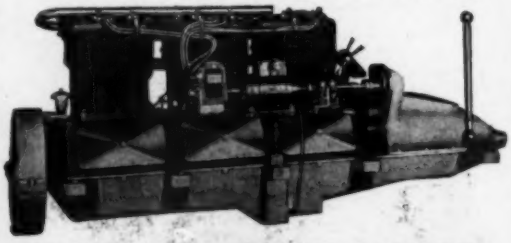


Scripps

"The Motor that Crossed the Atlantic"



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The SCRIPPS line is unusually complete. It includes power plants for every marine purpose, of every size and type from 10 to 125 H.P.—all four cycle engines in two, four or six cylinders, medium duty or high speed—some using gasoline exclusively, others fitted for burning either gasoline or kerosene.

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FORCE FEED
MANZEL OILERS

The successful operation of any motor depends to a great extent upon its lubrication. No matter how nearly perfect its design, without proper lubrication it will not—it can not—be satisfactory.

The Manzel Oiler has been designed to give efficient and economical lubrication to any engine. It forces clean, fresh oil directly to the engine cylinders or bearings in just the right quantities and at exactly the right time.

It will oil the engine the way it should be oiled and will greatly reduce your oil bills.

It is made in sizes and styles to fit any engine.

Let us send you a catalogue telling all about it.

MANZEL BROTHERS COMPANY
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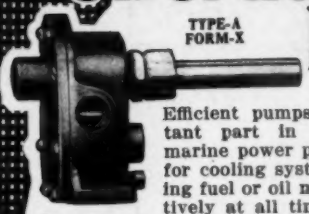
The Oberdorfer Pump



Efficient pumps play an important part in operation of a marine power plant. Pumps used for cooling systems or for supplying fuel or oil must function effectively at all times if the desired results are to be obtained. If your pump does not give the proper service you should investigate the

Oberdorfer Bronze Geared Pump

—a pump that never fails—a pump that fills every demand of the modern internal combustion engine. Oberdorfer Bronze Geared Pumps are compact, noiseless, automatic and reliable—the discharge is governed entirely by the speed of the motor.

A motor having one of these pumps as part of its equipment will not be troubled with over-heating or lack of lubrication.

Our new booklet should be read by every one interested in engines. Write for it to-day.

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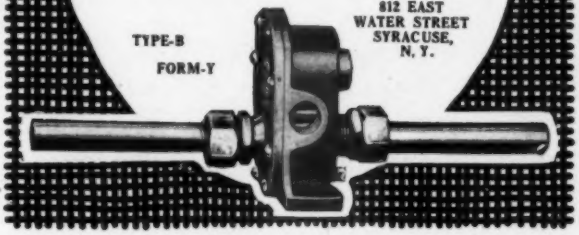
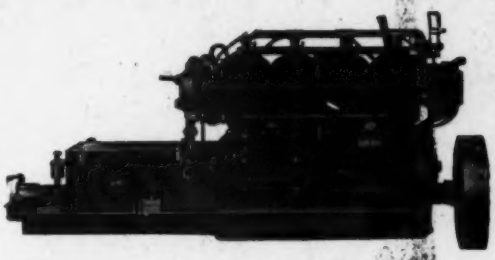


HALT

A MOMENT PLEASE!
Learn About DOMAN ENGINES



If you own a boat, if you need an engine for it, then you serve your interests and your future boating pleasure by learning about Doman engines. For 35 years we have been building marine engines, and for 20 years we have been building gasoline engines, and the Doman slogan has always been, ASK AN OWNER WHY YOU SHOULD BUY A DOMAN MOTOR. We are willing to stand and fall on the record the Doman makes with the man who buys them; we don't put out a good engine now and then, but every engine is built on honor and built to last. Go to any boat club, ask any disinterested man there what the members say of the Doman, and his report will be such that you WILL WANT TO OWN A DOMAN. Our catalog tells about the engine, it tells you what it's like, how made, etc. It shows engines from 6 to 40 hp., all four-cycle, 2 to 6 cylinders. There will be found engines for all classes of boats. This catalog and valuable information FREE if you tell us the size boat you are building. GET YOUR CATALOG TO-DAY. "NOW."

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The "Automatic"

THE AUTOMATIC insures dependable power at remarkably low cost. It operates efficiently on gasoline, kerosene or producer gas. It is simple in construction, easy to control and care for. It will last for years with minimum expense for upkeep.

AUTOMATICS are built in two models —for cruisers and work boats. Specially designed for the work to be done, each is a finished power plant that will satisfy the most critical owner. It is a thoroughly up-to-date engine suitable for the finest boat.

We shall be pleased to send you full information of the size you require.

The Automatic Machine Co.
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When Ships Sink You Can Take No Chances

"In a Flash" you are SAFE, the Self Adjusting (patented) neck piece closes tight as a Thermos Bottle.

You cannot Drown, you cannot Chill in your

Ever-Warm Safety-Suit

Simplicity

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The *ONLY* Life Saving Device That Has *Made Good*

In U-Boat and other tragedies at sea, many men, women and children have escaped death ONLY because they wore "Ever-Warm-Safety-Suits." Ask for the proof. Pamphlet "23" tells why you should not sail or let a loved one sail without an "Ever-Warm."

AT WORK ABOUT YOUR BOAT in an "Ever-Warm" you will be safe and warm for any kind of work.

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KEY MODEL
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First aid in construction

Made in 28"—36"—48"—72"

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wishes to announce that, owing to the completion of certain Government contracts, we can **now** accept orders for

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Burn Kerosene!

Use this cheaper fuel in a Wright Kerosene Engine and secure utmost power plant efficiency at half the usual cost.

Kerosene is the ultimate solution of the fuel problem and in the Wright Kerosene Engine you get its best results. There is no smoke or odor in the exhaust and it burns free from carbon or lubricating troubles.

Valves in cylinder heads. Make and break ignition.

2-Cyl.	6 x 7½"	15-18 H. P.
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3-Cyl.	7⅛ x 9"	35-45 H. P.
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4-Cyl.	7⅛ x 9"	45-60 H. P.
6-Cyl.	6 x 7½"	45-65 H. P.
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6 x 7½" runs from 400 to 850 R.P.M.
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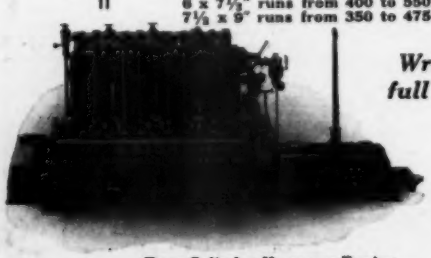

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Agents Wanted

Four Cylinder Kerosene Engine.
WRIGHT MACHINE CO.
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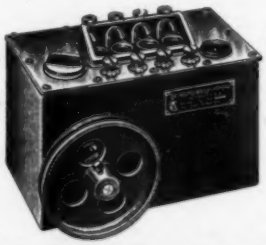

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DETROIT, U. S. A.
MAKERS OF STEWART CARBURETORS

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PRECISION

BALL BEARINGS

(Patented)

Preeminence must rest on performance. Claims are futile things, in these times when service is sought from all and placed before all. And nothing but the staunchest serviceability can maintain that character of performance which stands for full service faithfully rendered.

"NORMA" Precision Bearings—the standard bearings in high-grade ignition apparatus and lighting generators—have to their credit years of performance records under such speed conditions as to establish their preeminence beyond question.

Be SURE—See That Your Electrical Apparatus Is "NORMA" Equipped.

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We can light your Boat like this at a very small cost.

OUTFIT

No. 1.....	4 lights,	6 volts,	24 C.P.
No. 2.....	8 lights,	6 volts,	64 C.P.
No. 3.....	10 lights,	12 volts,	120 C.P.
No. 4.....	15 lights,	12 volts,	180 C.P.
No. 5.....	20 lights,	32 volts,	240 C.P.
No. 6.....	30 lights,	32 volts,	480 C.P.

All the above outfits consist of a Dynamo, Switchboard and Storage Battery.

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For anchors up to 150 lbs. Has Winch Head for rope; wild-cat for chain cable. You can heave on a line—let the chain run free—or stop it instantly at any point. Three operations controlled by one Heaving Lever. No complicated parts.

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The "Frisco" Pump Water Closet, with its extra heavy Vitro Adamant oval hopper bowl, and 3-inch Supply & Waste Pump, of smoothed non-corrosive metal, will satisfy you, or we have others that will do so.

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Weighs 80 lbs.—boxed, 150 lbs.

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Their work is done. They are returning wiser in experience, stronger in mind and body, and more keen in their realization of the value of their early sailing days.

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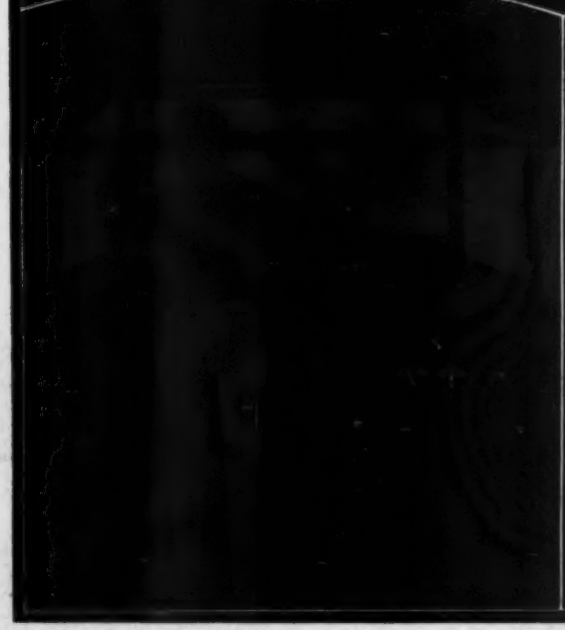

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Manufacturers who decide to go after this profitable business will find that they can secure the best and most lasting results by using Luma.

Luma contains only Radium as its activating agent. Its luminosity is pleasing and of great permanency.

Made in several grades.

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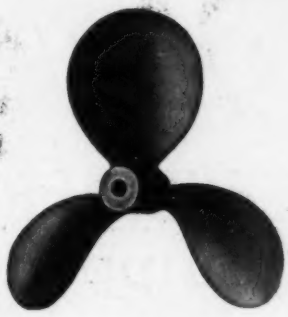
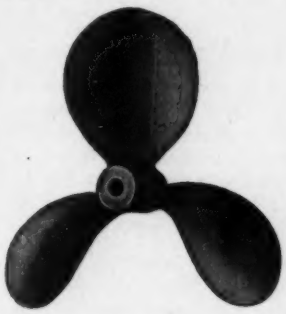
HYDE TURBINE TYPE PROPELLER

THAT WILL PRODUCE MAXIMUM RESULTS.



CORRECTLY DESIGNED, MADE OF THE HIGHEST GRADE MATERIAL AND ACCURATELY FINISHED, THE HYDE EMBODIES ALL THE REQUISITES FOR DEVELOPING THE HIGHEST DEGREE OF EFFICIENCY.



If you are in doubt regarding the correct wheel for your boat, our Service Department will gladly assist you in securing a propeller to meet your individual requirements.

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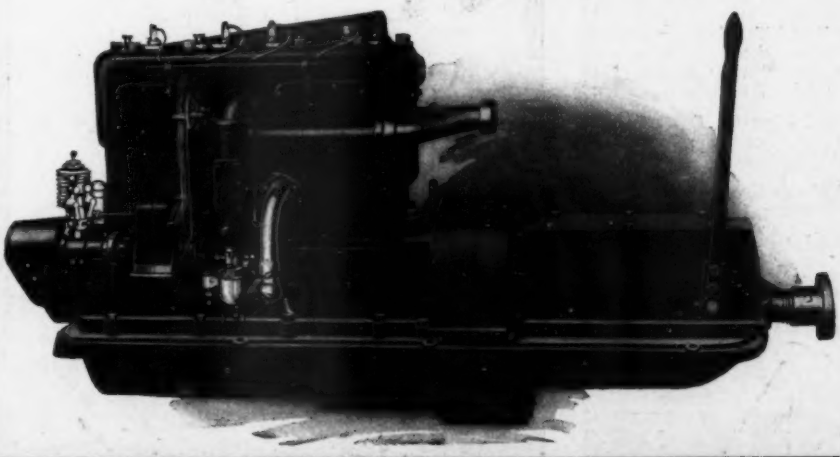
If you plan to install a new power plant in your boat it will pay you to investigate the Miller line of marine motors. We welcome tests of the most rigid character knowing as we do the sterling qualities built into our product.

Miller motors are constructed in a wide variety of sizes and models and there is one that is adapted to your particular requirements. They have for years rendered an exceptionally satisfactory service among boatmen who demand absolute reliability and consistent performance at all times.

Miller motors are built right—they are built for constant service and sell at a reasonable price. They offer power plant perfection developed to the highest degree.



Fourteen models, all four cycle. Medium and heavy duty types. 4 to 65 H.P.

Write to-day for catalog and prices

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For Water Craft and Flying Boats

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Made in varying grades for different purposes. Pound for pound it will go further and do a better and more lasting job than any other kind. Its peculiar properties are its permanent flexibility and great durability. It adheres indefinitely to timber, fiber, etc., and is clean and insoluble in water.

Nowhere is it more evident that Quality is Economy. The labor cost of applying any glue is many times the cost of the material. That's why it is economy to pay a little more for Jeffery's because it will outlast any other.

No. 1—Extra Quality for Deck and Hull Seams of Yachts and Motor Boats. Black, white, yellow or mahogany color. Give black the preference; it is more elastic and satisfactory in every way.

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Waterproof Liquid Glue is used for the same purposes as No. 7 Soft Quality. Ready for use and requires no heating; simply open the can and paint it on. Especially recommended in combination with linen between the veneer of the diagonal planking of flying boats. Will also attach canvas, cork, felt, rubber, leather, and linoleum to iron, steel, or wood.

Special Marine Canoe Glue. Best Filler for Canvas. Black, White and Yellow. Every canoeist should carry one of the 35c emergency cans. Sent by mail on receipt of 40 cents in stamps. Canada 47 cents.

For SHIP'S DECK use No. 2 First Quality Ship Glue, or No. 3 Special Navy Glue. Put up in 1, 2, 3 and 5 lb. cans; also 14, 28, 56, 112 lb. boxes.

Sold by all Yacht, Boat and Canoe Supply Houses, Ship Chandlery, Hardware and Sporting Goods Dealers.

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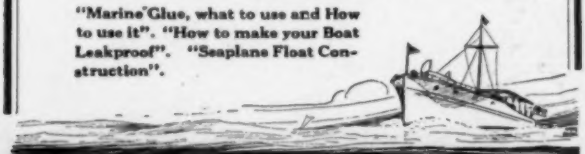
"Marine Glue, what to use and How to use it". "How to make your Boat Leakproof". "Seaplane Float Construction".



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Lunkenheimer Motor Accessories embody the most practical design with high quality materials and expert workmanship; and the rigorous tests which they undergo both before and after assembling is positive proof of their perfection. They have demonstrated their reliability on all types of internal combustion engines and are in use everywhere.

All the parts are made to gauge and are interchangeable, permitting the repair or renewal of a part should occasion require.

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—"QUALITY"—
Largest Manufacturers of
High Grade Engineering Specialties
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Even These Great Couriers of the Sea Meet With Disaster

When you travel on the water, no matter where or how—whether on a great ocean liner or in your own cruiser or yacht—your life will be protected and your comfort assured in case of disaster if you provide yourself in advance with a

Put on over your regular clothing in less than a minute

Universal Safety Suit

The Universal Safety Suit is a marked improvement over every other life preserver and life suit. It keeps you *safe, dry, warm* and *comfortable,* no matter how long you stay in the water.

It is made of rubberized material that is *soft* and *pliable,* allowing the wearer perfect *freedom of movement,* and it is *absolutely* waterproof. The rubberizing is protected by a very strong fabric, making the chance of puncturing this suit much less than in suits which have the rubberizing on the surface.

The buoyancy is secured by a lining of downy Kapoc, the material specified and used on Uncle Sam's transports, and is much greater than required by government life preserver regulations. No air cells are used—the buoyancy is not affected by contact with the water. This is the only suit in which you can swim or float in any position—you could actually sleep in the water safely. Lighter than other suits and requires less storage space. Made for men, women and children.

The "Universal" is the lowest in price, best in quality and most efficient life preserver suit on the market to-day.

Masten's Patent Life Preserver Jacket—A Favorite with Boat Owners

A practical garment that can be worn constantly with comfort and convenience as it does not hamper the wearer in normal movements. Light in weight and as warm as a reefer.

The buoyancy is sufficient to float four persons fully clothed for an indefinite period—no air cells to be punctured. An important feature is the collar which has enough buoyancy to float the head, even should the wearer become unconscious. You could not drown in this jacket.

Approved by the Department of Commerce, Steamboat Inspection Service, and the Secretary of Commerce of the United States. Used by the Army Transport Service and the Navy.

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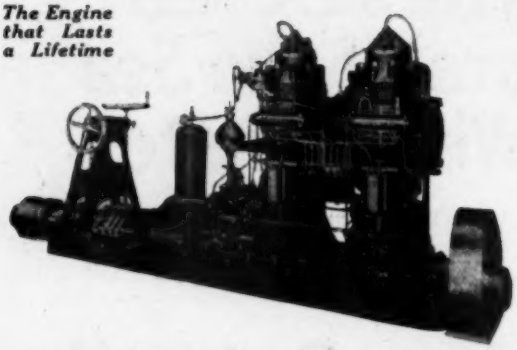
Power Plant Perfection for the Work Boat

The Engine that Lasts a Lifetime



The Gulowsen "Grei" Engine is a powerful heavy duty power plant that operates efficiently and economically. It is the oldest crude oil engine on the market today, having been built for the last sixteen years.

It burns crude oil and may be had in a variety of sizes from 4 to 100 H. P. Under normal conditions it consumes about ½ pint of fuel and less per H. P. per hour.

The Gulowsen "Grei" is remarkable because of its unusual flexibility—something rarely found in a heavy duty plant. In equipping your work boat with this motor you will overcome all of the heavy duty problems.

4 to 100 B. H. P. ready for immediate delivery from Seattle or New York. Reasonable deliveries on larger sizes up to 360 B. H. P.

Write today for catalog.

M. H. Tracy Co., Inc. 17 State St., New York.

Motor Manufacturers Predict a Banner Season

(*Continued from page* 18)

experimenting with the use of the heavier oils as satisfactory fuels. We do not feel justified at the present time in making any prophesy for the immediate future along the line of a universal fuel. We do feel, however, that in the case of the heavy-duty engine the heavy fuel will be the rule rather than the exception.

We feel that the demand for a power plant, either for the commercial or pleasure type of craft can be summed up in four words: reliability, efficiency, accessibility, and cleanliness. The word reliability needs no explanation. By efficiency we mean the power plant which delivers a constant output at a minimum cost of attention and money. Accessibility needs perhaps just a touch. There have been on the market several motors whose reliability and efficiency were unquestionable but when it came to the matter of making adjustments, it was a half a day's job to do that particular thing which should have taken five or ten minutes, due to the fact that it was necessary to perform innumerable operations and remove several parts in order to arrive at the ultimate goal. This particular condition should have the most careful attention.

Cleanliness is so closely related to efficiency as to be hardly separable. A dirty engine is wasteful and therefore cannot be efficient. A power plant which embodies the first three qualities without the fourth is absolutely no power plant for any type of boat, either pleasure or commercial, and the summing up of a year's operation bills will most thoroughly bear out this contention. The words reliability, efficiency, accessibility, and cleanliness should be on the desk of every manufacturer now as never before as the marine motor business now, is going to be a sane and sound business and sales will be influenced more strongly than ever by the merits of the product, the actual price being more of a secondary consideration than in the past.

E. J. STONE, KNOX MOTORS CO., Springfield, Mass.

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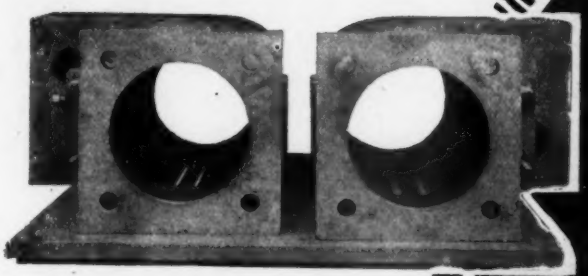
"EVERY action has an equal contrary reaction." The wording of that old law of physics holds true, verbatim and absolutely to the change that will surely come in our existence with the end of the war. Where before there was curtailment and restriction there will be freedom from restraint; silence will give way to noise and music of liberated joy; instead of continual effort there will be work interspersed with a great deal of pleasure; exhaustion will be rewarded with relaxation and recreation. And the serious work of reconstruction will be benefited thereby.

Water sports, motor boating, fishing and yachting will easily hold their place as the most highly recreative of pleasures. Always popular, they'll be more so now after Uncle Sam has treated thousands upon thousands of vigorous men to a real taste of the water. Our boys will long remember and enlarge upon those experiences. Even months ago the old fans have been writing that the biggest regatta ever—or the greatest vacation— or the longest cruise will take place when the boys come home. Finances will be good, too.

What do we find right here at home? Since early in the year our plant has been rushing out war essentials. While the boys have been fighting each man here has been struggling to obtain maximum production in the face of the greatest difficulties. It was hard to maintain service to customers at the same time but through it all there was no weariness. Now there isn't a man in the organization that does not look forward to the return to producing, marketing or maintaining motors without positive enthusiasm. There is easily as much willingness to help making Evin-

(*Continued on page* 82)



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You can make your motor render a longer and better service by having your scored cylinders restored by this inexpensive method. In these days of limited production it is necessary that your engine be kept in the pink of condition, as it will be some time before manufacturers will be in a position to furnish a new one. And besides, practical economy dictates the wisdom of repairing instead of re-purchasing.

Patented This Process

has been perfected to a point where it is impossible to distinguish restored cylinders from new ones. Our skilled workmen electrically fuse a silver nickel alloy into the scores or defects and then refinish them as good as new. The bore of the cylinder is not altered in the slightest degree—the standard piston and rings fit perfectly, restoring compression as a result. Our patented method cannot harm the cylinders and the work is guaranteed for the life of the motor.

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Write to-day for our prices and full particulars, sending your inquiry to our nearest service plant. Be sure to state size and the defects requiring repair. Do this while your boat is out of the water—costs may be much higher next spring.

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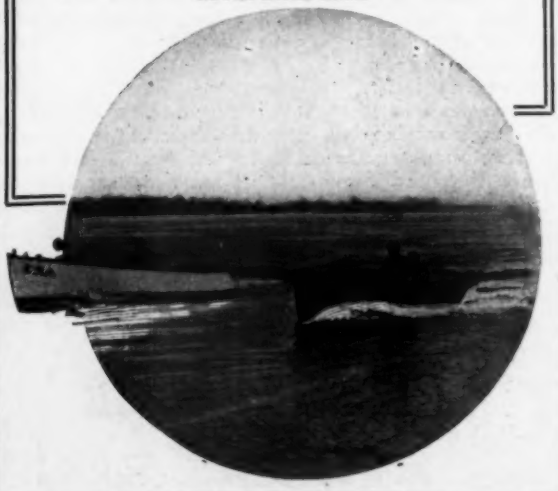
	Kansas City	

Canadian Factory: W. H. Banfield & Sons, Ltd., 372 Pape Avenue, Toronto



America's Four-Cycle Motors for Nineteen Nineteen

(*Continued from page 28*)

54 to 145 Horsepower (Continued)

Rated H. P.	Motor	No. of Cyls.	Bore & Strokes	R.M.P.	Wt. of Motor	Location of Valves	Ignition
85	Harris	4	8 x10	400	5,500	L	D.
85	Sterling	6	5½x6¾	800	2,350	T	M. & D.
85	Sterling	4	5½x6¾	1,200	1,600	T	M.
85	Union	4	9 x11	330	10,148	..	O.
85	Wisc. Cons.	6	5½x7	800	1,585	T	M.
90	Automatic	3	10½x15	250	....	T	J. S.
90	M. & T.	4	9 x12	325	6,000	H	M. B. M.
90	Wisc. Cons.	6	5¾x7	800	1,615	T	M.
90	Wright	6	7½x9	475	7,250	H	M. B.
95	M. & T.	4	8½x11	325	5,200	H	M. B. M.
100	Anderson	4	9¼x11	400	6,800	T	M. B.
100	Automatic	4	10 x14	275	11,780	L	O.
100	Automatic	4	8½x10	500	6,100	L	J. S.
100	Acme	6	8¼x10	400	8,900	H	O.
100	Buffalo	4	10 x12	300	8,200	..	J. S.
100	Clay	4	8½x10	350	7,500	H	M.
100	Elco	6	5½x6	1,000	1,000	T	M.
100	Niagara	6	5½x7	900	2,145	T	D. & M.
100	M. & T.	6	7½x10	400	....	H	M. B.
100	M. & T.	6	6½x9	500	3,000	H	M.
100	Standard	6	8 x10	400	8,000	L	M. B.
100	Sterling	4	5½x6¾	1,400	1,275	T	M.
100	Van Blerck	4	5¾x6	1,500	1,560	T	M. & D.
105	Automatic	6	7½x9	500	7,000	L	J. S.
110	Union	3	12 x15	280	17,600	..	O.
110	Union	4	10 x12	330	12,360	..	O.
110	Wolverine	3	12½x14	300	10,117	L	J. S.
115	Sterling	8	5½x6¾	800	2,700	T	M. & D.
115	Speedway	6	6¾x8½	600	5,000	L	J. S.
120	Automatic	4	10½x15	250	....	T	J. S.
125	Acme	6	8¾x10½	375	10,800	H	O.
125	Harris	6	8 x10	400	7,600	L	D.
125	M. & T	6	8½x11	325	6,200	H	M. B. M.
125	Union	6	9 x11	320	14,400	..	O.
125	Sterling	6	5½x6¾	1,200	2,050	T	M.
125	Winton	6	8 x11	500	10,000	L	M.
130	Speedway	6	5¾x7	1,000	2,400	L	J. S.
145	Sterling	6	5½x6¾	1,400	1,650	T	M.
150	Automatic	6	8½x10	500	9,200	L	J. S.
150	Automatic	6	10½x15	250	....	T	J. S.
150	Buffalo	6	10 x12	300	12,800	..	J. S.
150	Harris	4	11 x13	350	8,000	L	D.
150	Niagara	6	6¼x7	900	2,350	T	D. & M.
150	Speedway	6	5¾x7	1,200	1,900	L	J. S.
150	Standard	6	8½x11	400	5,800	L	M. B.
150	Union	4	12 x15	290	23,550	T	D. & M.
150	Van Blerck	6	5¾x6	1,500	1,900	T	M. & D.
160	Speedway	6	8½x10	550	5,900	L	J. S.
160	Wolverine	6	9½x12	400	11,765	L	J. S.
170	Sterling	8	5½x6¾	1,200	2,600	T	M.
175	M. & T.	6	10 x12	325	11,000	H	M. B. M.
175	Speedway	8	5¾x7	1,000	2,900	L	J. S.
200	Automatic	6	12 x16	200	....	T	J. S.
200	Niagara	8	6¼x7	900	3,010	T	D. & M.
200	Speedway	8	5¾x7	1,200	2,350	L	J. S.
200	Sterling	8	5½x6¾	1,400	2,400	T	M.
200	Van Blerck	8	5¾x6	1,500	2,275	T	M. &D.
200	Winton	6	9½x14	475	18,000	L	M.
200	Wolverine	6	11 x15	300	16,630	L	J. S.
225	Harris	6	11 x13	350	11,000	L	D.
225	Union	6	12 x15	300	30,600	..	O.
225	Union	4	14½x18	225	36,400	..	O.
250	Automatic	6	13½x18	200	....	T	J. S.
250	Sterling	8	5½x6¾	1,700	1,495	H	M.
250	Speedway	6	11 x12	450	11,400	L	J. S.
250	Union	4	15¼x20	200	49,785	..	O.
260	Duesenberg	6	6¾x7¾	1,300	3,250	S	M.
300	Sterling	8	6¾x9	1,000	5,600	..	O.
300	Union	4	16 x21	210	57,500	..	O.
325	Union	6	14½x18	225	50,400	..	O
350	Cottrell-Holmes	12	6 x8¼	1,200	3,600	L	M.
360	Duesenberg	8	6¾x7¾	1,300	3,600	S	M.
375	Union	6	15¼x20	200	69,100	..	O.
400	M. & T.	6	7½x9	1,400	3,800	H	M.

Motor Manufacturers Predict a Banner Season

(*Continued from page 80*)

rudes as there was to help win the war. That one will be as successful as the other we do not doubt.

The next year or two will see developments in internal combustion engines that up to this time people have only dared to imagine. Though busy on government work, keen minds have developed new ideas. These will burst forth in rapid succession and all of them will add to the engine owner's comfort, satisfaction, and pleasure.

Perhaps you don't agree with our thoroughly "unsmoked" view of the situation. But—

How do you feel about it? Now that you've missed one vacation and are still with us are you going to pass them for ever more? No? Then let your determination to get more out of life—to assist work with more play—grip you now. Then you'll be prepared to enjoy the outdoor days with plans completed and equipment up-to-date. The enthusiasm of the boys coming back will link up with yours. The result will be an atmosphere of rejuvenation—of joy in the Great Outdoors.

H. PIERSACH, EVINRUDE MOTOR CO., Milwaukee Wis.

The Universal Motor

The Leaders

The UNIVERSAL 9-12 H.P. Marine Motor
the UNIVERSAL 4 K W Generating Set

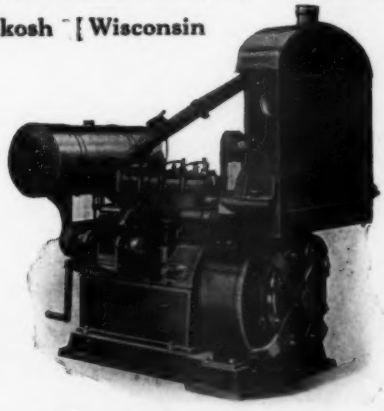
It is the ideal power plant of its size for pleasure or work boats—it offers the careful buyer an opportunity to secure a powerful reliable motor that functions with utmost efficiency at all times under all conditions.

A feature of prime importance in these days of high prices is the fact that fuel consumption is reduced to a minimum in the Universal. Fuel and lubricant is used in sparing quantities—yet full power and efficient lubrication is retained at all times.

Universal motors have solved the power plant problems of hundreds of boatmen in many different parts of the world. You can do likewise by installing the most successful engine of its size in your boat.

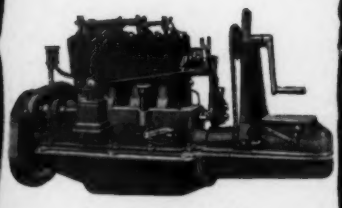
UNIVERSAL MOTOR COMPANY

Oshkosh [Wisconsin



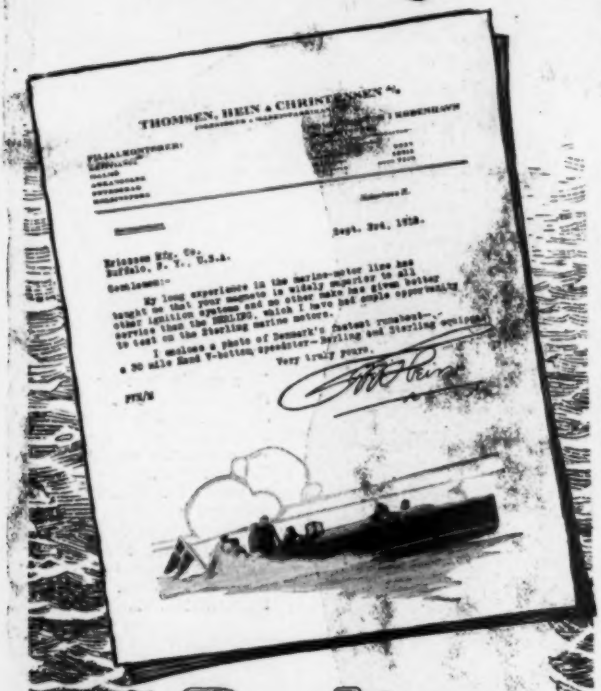
4 K W Electric Generating Set

The marine motor is its standard size for all sizes and types of boats up to 30 feet. (See bulletin No. 29.) The generating set solves the lighting problem for house boats, launches, electric cooking, search lights, cottage lighting, etc. Send for bulletin No. 26.



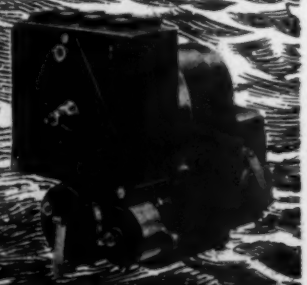
9-12 H. P. Marine Motor

Denmark's fastest boat boasts of Berling


THOMSEN, HEIN & CHRISTENSEN
Sept. 3rd, 1918.
Ericsson Mfg. Co.
Buffalo, N. Y., U.S.A.
Gentlemen:
My long experience in the marine-motor line has taught me that your magneto is wholly superior to all other ignition systems and no other make has given better service than the BERLING, which I have had ample opportunity to test on the Sterling marine motors.
I enclose a photo of Denmark's fastest runabout—a 30 mile Hand V-bottom speedster—Berling and Sterling equipped.
Very truly yours.

Berling Magneto

Ericsson Mfg. Company
Buffalo, N.Y.



WORTH MORE
DOES MORE

Exporting—the Policy of the Future

(*Continued from page* 43)

public spirited citizens offer "travel prizes" to successful students in foreign trade courses?

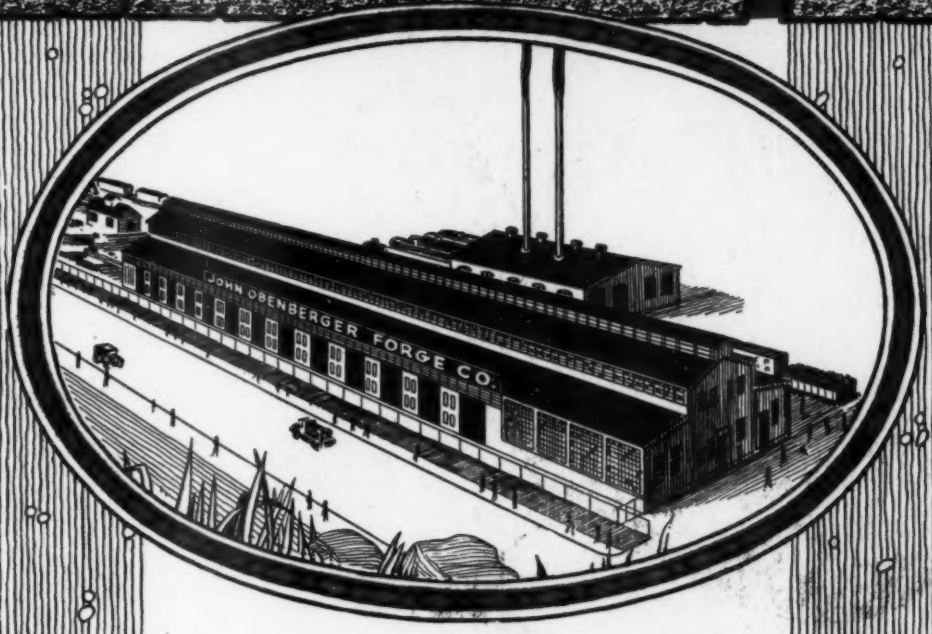
Are not these things of interest to us manufacturers and exporters? Shall we be clams, or shall we wake up and take a real, an active, personal part in our national life?

Twelve hundred men attended the October convention of the American Manufacturers' Export Association. In previous years the attendance was usually 200 or 300. That is only one indication of the present increased interest in our export trade. Literally thousands of our manufacturers are looking forward to largely increased trade throughout the world.

Exports of Domestic Gasoline Marine Engines and Motor Boats from the United States, by Countries, During the Fiscal Year Ending June 30, 1918

	Internal Combustion Gasoline Marine Engines		*Motor Boats*	
	Number	*Dollars*	*Number*	*Dollars*
Azores and Madeira Isl.	2	$896	...	.....
Denmark	90	12,768	...	.....
France	155	170,560	2	$2,400
Iceland and Faroe Isl.	10	1,026	...	.....
Italy	358	464,498	72	2,080,800
Norway	317	58,128	1	3,000
Portugal	25	15,032	...	.....
Russia in Europe	12	13,245	10	117,500
Spain	94	43,707	1	999
Sweden	49	10,715	...	.....
Switzerland	7	708	...	.....
England	341	174,988	1	1,200
Bermuda	8	685	...	.....
British Honduras	14	2,272	...	.....
Canada	2,553	809,973	22	27,296
Costa Rica	1	231	...	.....
Guatemala	6	449	...	.....
Honduras	2	1,206	...	.....
Nicaragua	16	9,237	3	3,750
Panama	18	13,058	6	5,538
Salvador	....	.....	1	4,750
Mexico	79	40,109	36	111,630
Miquelon, Langley, etc.	70	7,305	...	.....
Newfoundland and Labrador	735	80,811	...	.....
Barbados	3	637	1	1,500
Jamaica	5	2,747	...	.....
Trinidad and Tobago	20	2,400	...	.....
Other Brit. West Indies	7	1,227	2	1,650
Cuba	421	75,143	7	5,301
Danish West Indies	3	395	...	.....
Dutch West Indies	3	1,511	...	.....
French West Indies	15	1,528	1	462
Haiti	11	1,008	...	.....
Dominican Republic	11	4,009	3	2,210
Argentina	196	30,004	2	2,496
Brazil	105	19,259	4	4,575
Chile	83	28,091	8	18,788
Colombia	5	759	3	19,933
Ecuador	11	15,026	1	335
British Guiana	30	7,635	1	6,000
Dutch Guiana	1	572	2	3,000
Peru	60	45,003	6	11,531
Uruguay	8	1,128	1	585
Venezuela	21	3,989	4	4,060
Aden	1	148	...	.....
China	44	36,107	2	1,089
French China	2	180	...	.....
British India	259	130,745	3	2,025
Straits Settlements	118	22,220	...	.....
Dutch East Indies	106	24,819	3	804
Hongkong	11	25,691	...	.....
Japan	154	33,243	1	287
Siam	45	10,655	...	.....
Australia	313	55,574	...	.....
New Zealand	30	15,777	...	.....
Other British Oceania	29	5,437	3	6,407
French Oceania	24	9,875	1	1,000
German Oceania	11	14,788	...	.....
Philippine Islands	73	40,075	...	.....
British West Africa	4	583	...	.....
British South Africa	13	2,079	...	.....
British East Africa	....	.....	2	827
French Africa	4	435	...	.....
Liberia	1	190	...	.....
Portuguese Africa	2	706	2	6,855
	7,225	$2,603,104	218	$2,460,583

Obenberger



We specialize on Drop Forgings and Forgings Hammered from Billets, and our plant and equipment are quite ample to handle still more business.

We invite marine engine builders to get in touch with us. We are in a position to handle orders with dispatch, at the same time conserving all of the Obenberger quality which is, with us, but another word for perfection.

Let us serve you.

John Obenberger Forge Company
West Allis - - - Wisconsin

JOHN OBENBERGER FORGE CO. BETTER FORGINGS BETTER SERVICE MILWAUKEE WIS PLANT WEST ALLIS

THE MARK THAT STANDS for OBENBERGER SERVICE

JOHN OBENBERGER FORGE CO. BETTER FORGINGS BETTER SERVICE MILWAUKEE WIS PLANT WEST ALLIS

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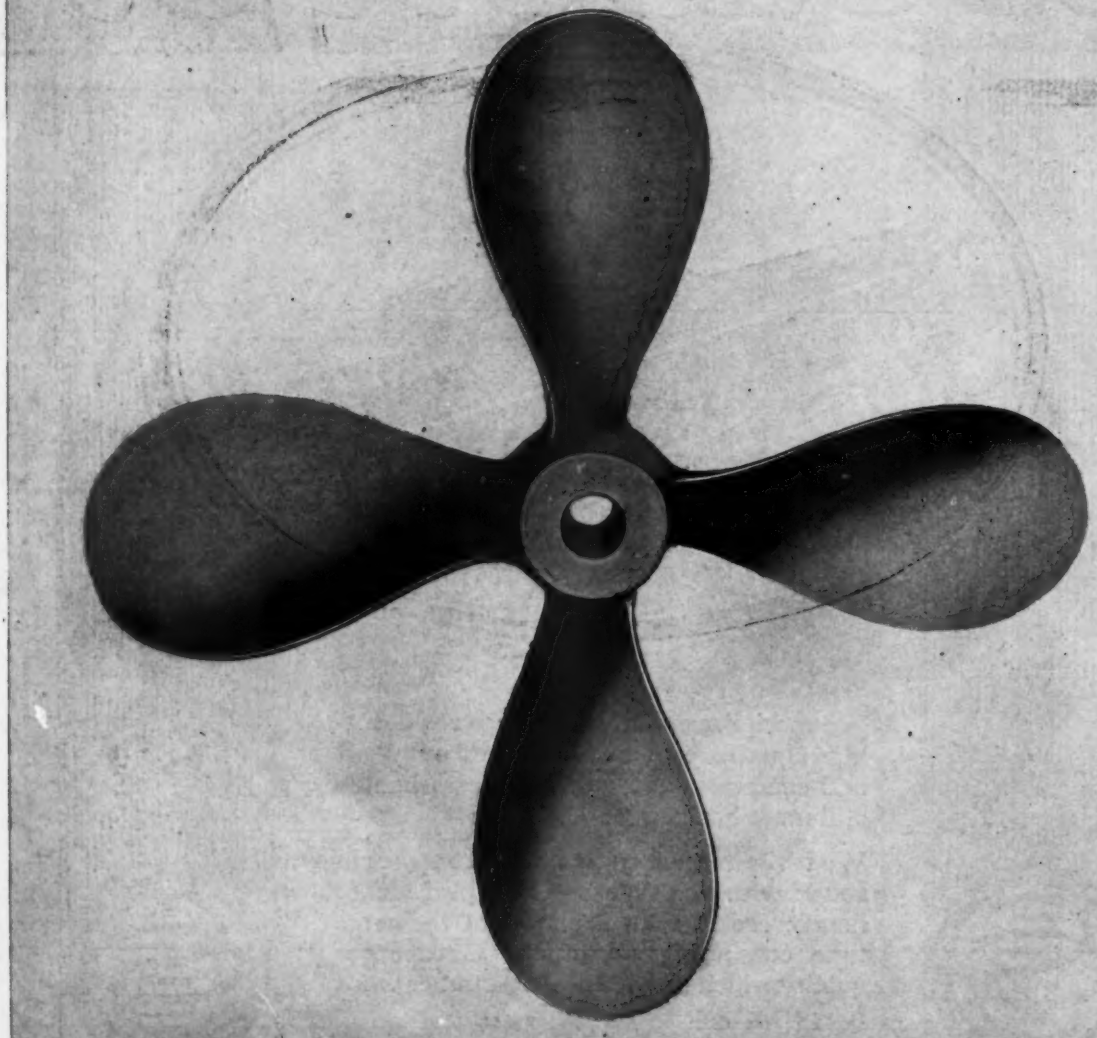
Forgings

COLUMBIAN
BIG BRONZE PROPELLERS



The well-earned reputation of the Columbian Propeller for Motor Boats has done much to open up the field of Big Bronze Propellers for the Columbian Bronze Corporation. So successful have been the initial Big Bronze Propellers shipt from our Freeport factory that we have decided to manufacture a complete line of Standardized Big Bronze Propellers, just as we do a complete line of Motor Boat Propellers—thus completing our line and making it possible for us to fill practically every propeller order offered us, from the smallest wheel to the biggest.

YOUR BOAT WILL BE A BETTER BOAT IF EQUIPT WITH COLUMBIAN PROPELLERS.

Columbian Bronze Corporation

Executive Offices: 50 Church Street, New York City

New York City Local Salesroom: Concourse, 50 Church St., Factory, Freeport, L. I.

Address all correspondence to the Executive Offices except for New York City Sales

PARAGON TRANSMISSIONS

TRANSMISSIONS that transmit *all* the power from your motor to your propeller—that's what counts.

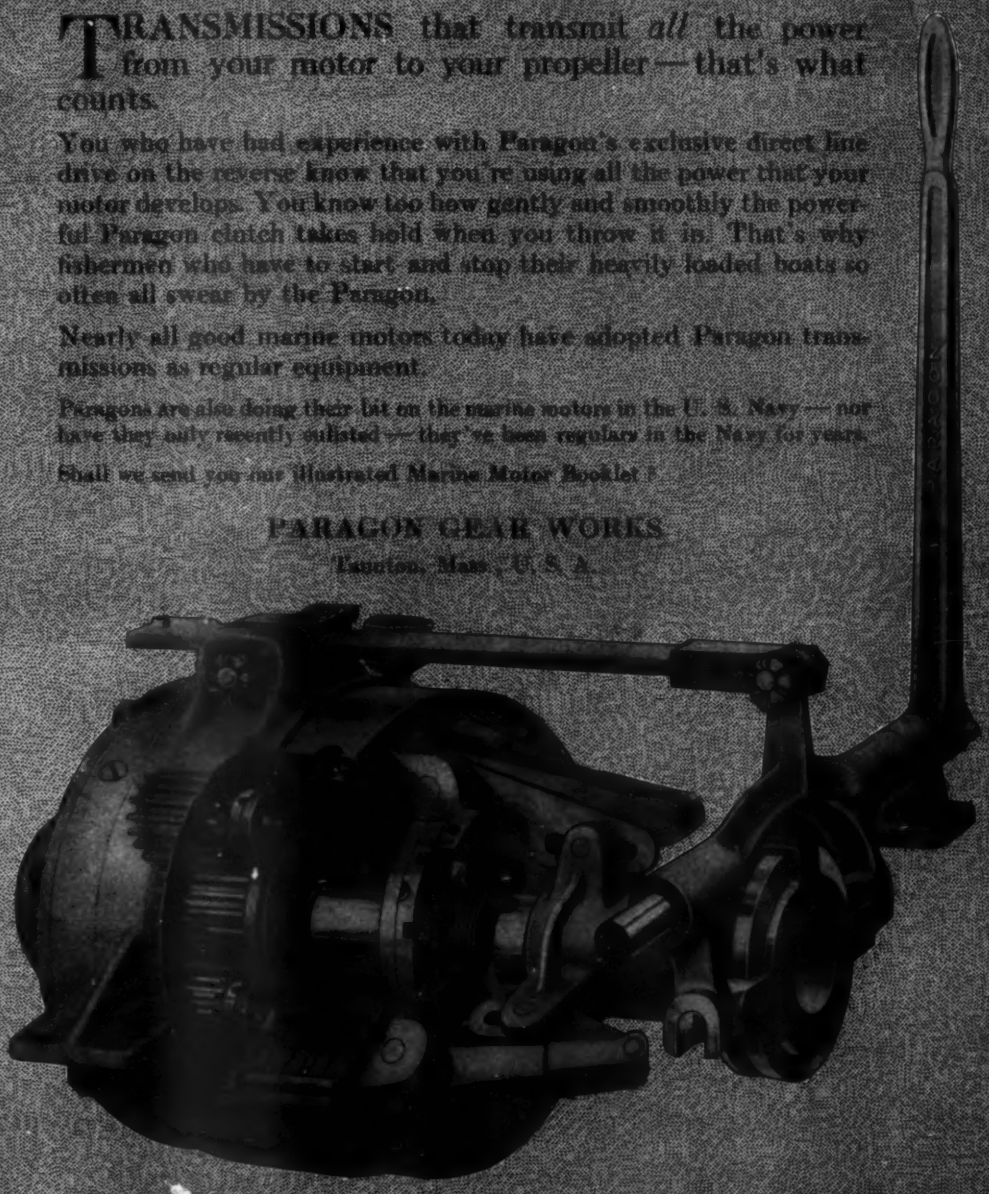
You who have had experience with Paragon's exclusive direct line drive on the reverse know that you're using all the power that your motor develops. You know too how gently and smoothly the powerful Paragon clutch takes hold when you throw it in. That's why fishermen who have to start and stop their heavily loaded boats so often all swear by the Paragon.

Nearly all good marine motors today have adopted Paragon transmissions as regular equipment.

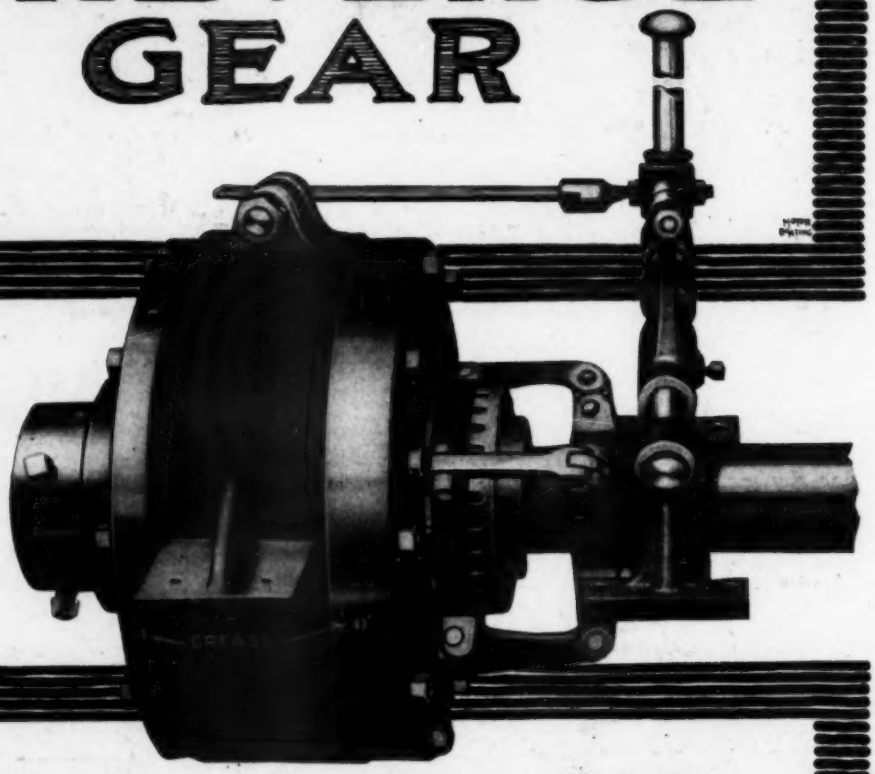
Paragons are also doing their bit on the marine motors in the U. S. Navy — nor have they only recently enlisted — they've been regulars in the Navy for years.

Shall we send you our Illustrated Marine Motor Booklet?

PARAGON GEAR WORKS
Taunton, Mass., U. S. A.



JOES REVERSE GEAR



Pick Your Gear for Dependability

The first and most important quality of a reverse gear is dependability. A gear may have ever so many "selling features" but if it should fail in an emergency it is worse than useless. Pick your gear for dependability.

The Joes Reverse Gear, as the oldest and most successful gear on the market today, has a reputation for dependability which is known to every boat owner. It is the gear you can buy with full confidence that it will meet your every demand.

Joes Duplex Drive Heavy Duty Gear with its high ratio of reverse speed solves the reverse problem for Work Boat Motors. The same type of gear is also equally adaptable for the highest speed boats.

Joes Famous High Power Gears for high and medium speed motor are unexcelled.

Joes Absolute Neutral One-Way Clutches are designed for all high speed uses and Joes Regular One-Way Clutch is designed for all ordinary uses.

Joes Safety Rear Starters Make Starting Easy and Safe.

Send For Complete Catalog.

THE SNOW & PETRELLI MFG. CO., New Haven, Conn., U.S.A.

Agents: J. King & Co., 10 Church Row, Lime house, E., London, England; L. H. Coolidge Co., Seattle, Wash.; W. E. Gochenaur, 631 Arch St., Philadelphia, Pa.; A. R. Williams Machinery Co., Toronto; Pyke Motor & Yacht Co., Montreal, Canada. Sutter Bros., 30-50 Church St., New York City. Service Station, Foot of 92nd Street, Brooklyn, New York. Marine Equipment Co., Los Angeles Harbor, Wilmington P. O., Cal. A. G. Hegben, 436 Market Street., San Francisco, Cal.

Wisconsin
CONSISTENT
Motors

place at your disposal the power of Hercules—a giant ready for instant service under complete control.

Wisconsin Motors are dependable always—years of consistent performance have resulted in a reputation that guarantees the service of every power plant we build.

Just as the leading automobile manufacturers favor the Wisconsin so do experienced boat builders select it when building boats of the better kind.

Every motor built is a guardian of the Wisconsin good name—in building it that very idea dominates the efforts of our workmen.

Write for specifications of four and six cylinder types.

Wisconsin Motor Mfg. Co.
MILWAUKEE, WISC.
U. S. A.

THE IDEAL CHRISTMAS GIFT

MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical handbooks, MoToR BoatinG believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR BoatinG, and they are the result of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom *vs.* Sharp Bilge; What are the Advantages of Flare? Raised Deck *vs.* Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The $1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boats; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it; Advice for the Beginner; Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Way and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

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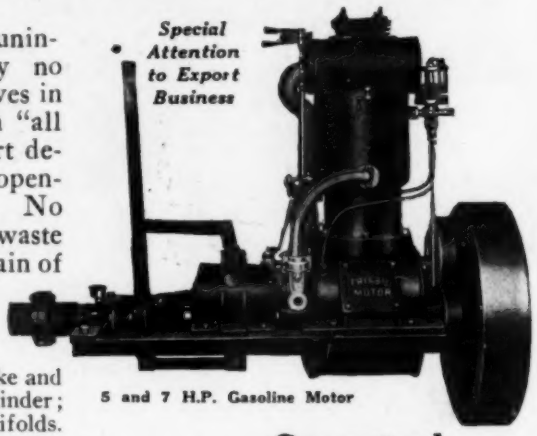

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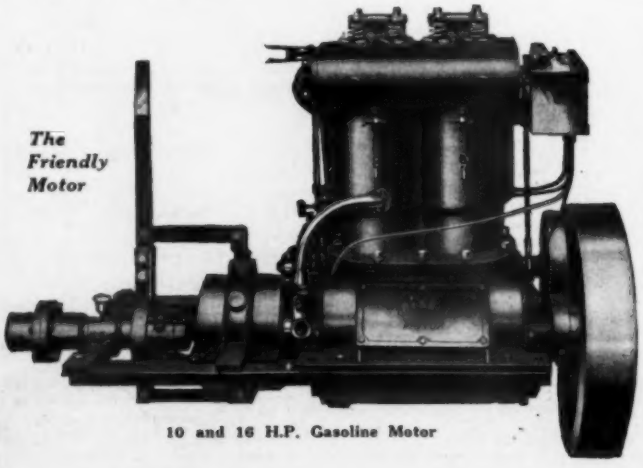

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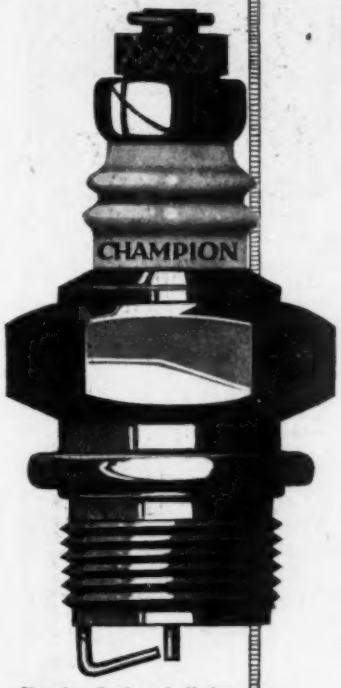

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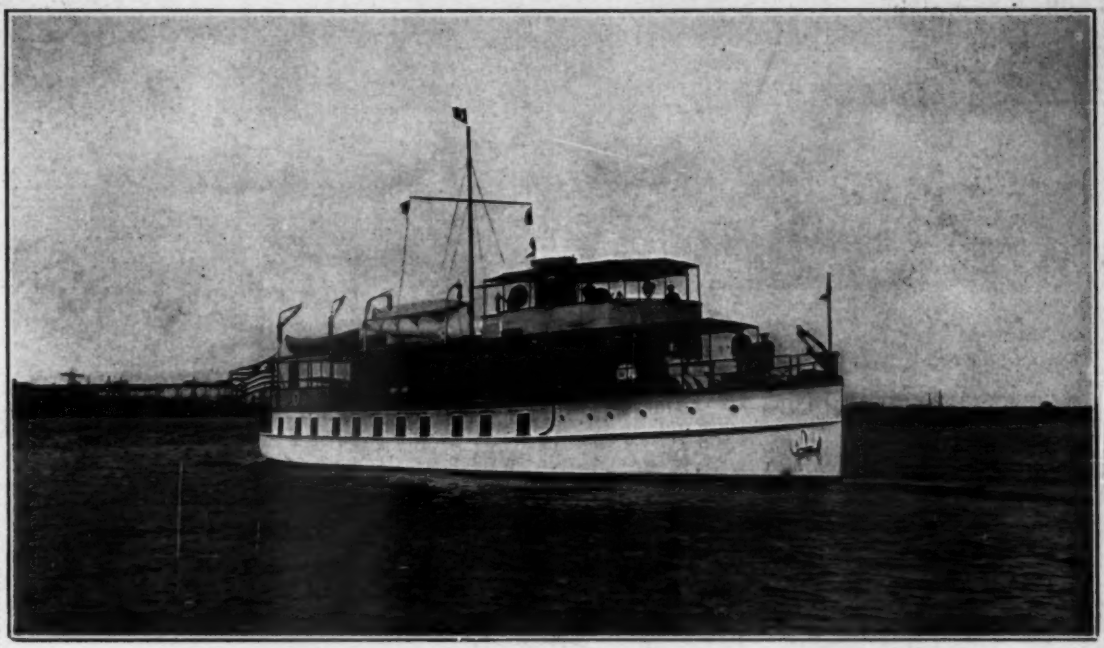

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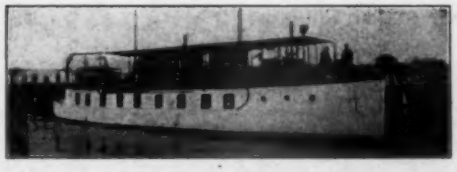

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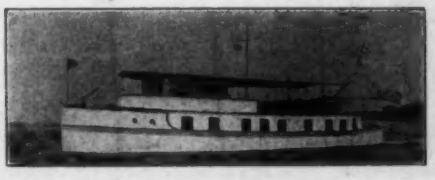

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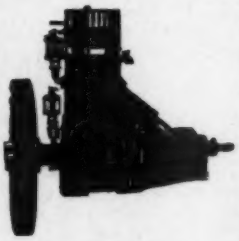

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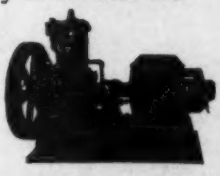

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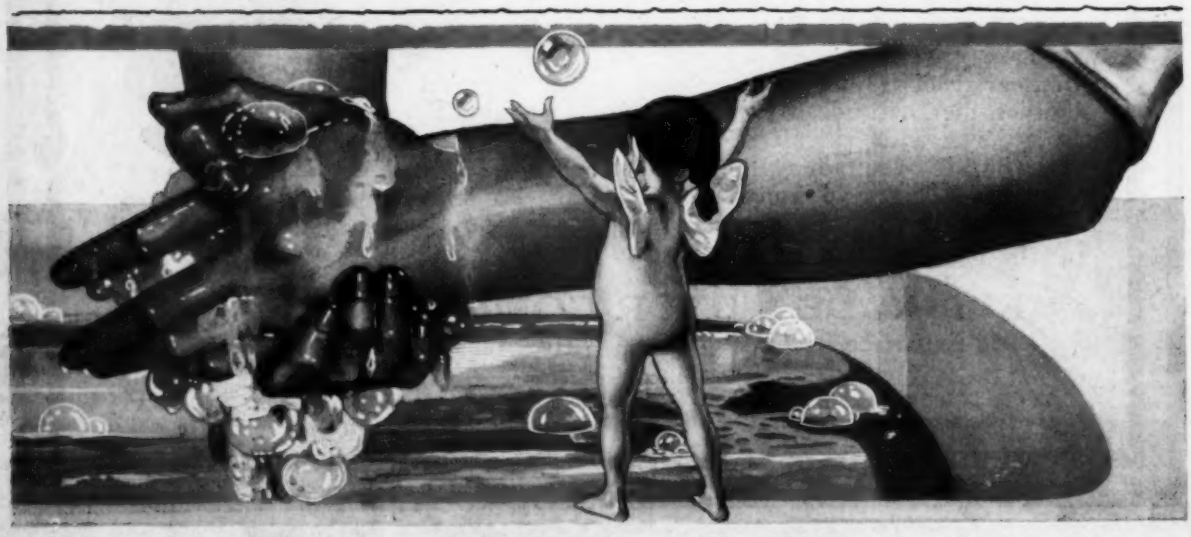

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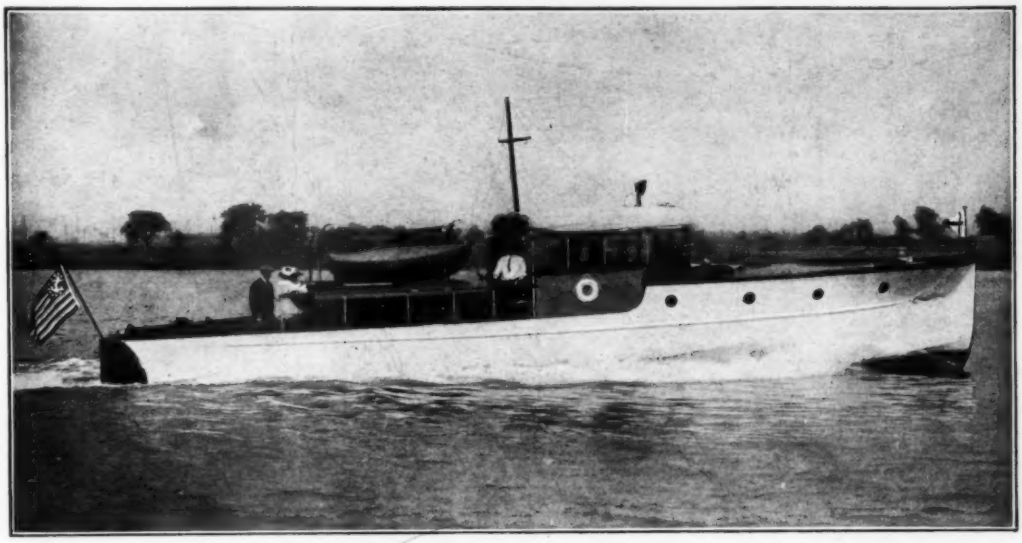

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A Hand V-Bottom Express Cruiser designed by Wm. H. Hand, Jr., for Mr. C. Barnum Seeley, Bridgeport, Conn., the well-known yachtsman who was part owner with Mr. Willson Marshall in the schooner "Atlantic."

Naturally the power plant in "Alarm" is a four-cylinder Van Blerck engine—as the equipment in this boat is the best obtainable throughout.

"Alarm" is practically a sister-ship of "Ricochet" owned by Mr. M. S. Cornell, Jr., which is likewise Van Blerck equipped.

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